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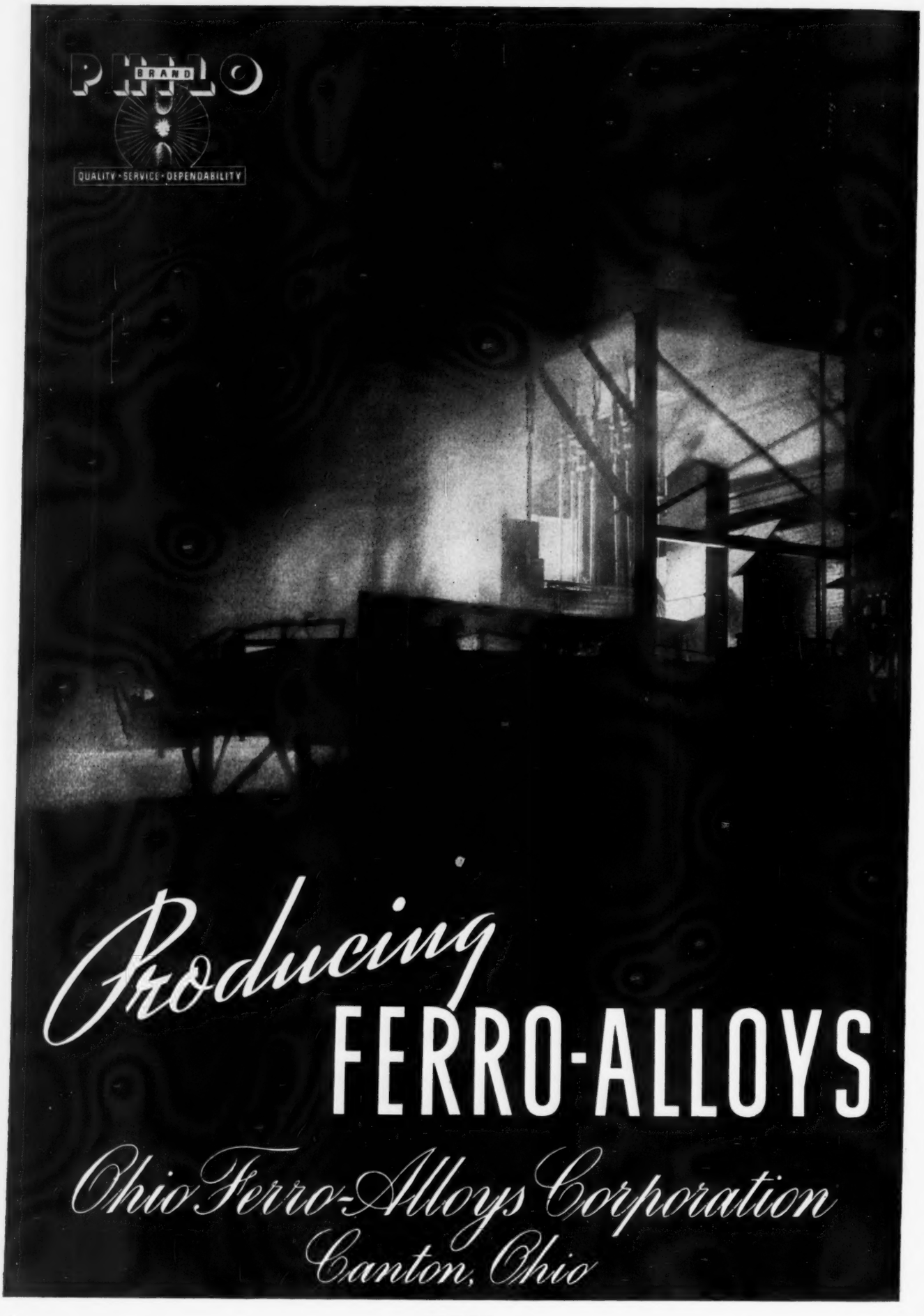
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As the Editor Views the News

EMPLOYERS in industry are watching closely the progress of the federal "social security" legislation in congress, trying to get a line on how it will affect their companies. It is certain that the burden of new expense will be distributed unevenly. For some of the larger corporations, including U. S. Steel, Bethlehem and the several large manufacturing concerns which have maintained pension plans in the past (p. 12), operation under the proposed federal laws probably will not impose any additional outlay. For others which heretofore had not adopted plans of this kind, an important new cost item will be introduced.

• • •

Private Pension Plans Best

In this respect, the nation-wide functioning of "social security" legislation will tend to equalize the burden. Under privately operated plans, the companies which paid pensions voluntarily assumed obligations which eventually put them at a certain disadvantage in competition with companies which did not pay pensions. Most fair-minded executives will agree that all companies in an industry should have practically the same pension policy. However, would it not be possible to do this through privately operated plans, rather than by a system which is operated by the government? The potential curse of the proposed federal plan is that it will be administered under political auspices, whereby millions of dollars will be wasted in inefficiency and pork barrel tactics.

• • •

Obsolescence to the Fore!

The high rate of acceleration in business improvement, manifested by the almost vertical rise in automobile production (p. 15) and by the most rapid expansion in steelworks activity recorded during the depression (p. 20), has provoked an argument as to the steelmaking capacity of the country. Gen. Charles G. Dawes and the American Iron and Steel institute exchanged views on the subject (p. 12), but without reaching a conclusive agreement. We believe that the capacity figures of the institute's committee are essentially correct for the purpose for which they are intended. Obviously they cannot take into account all of the factors which contribute to obsolescence, and therefore Arthur G. McKee probably is on safe ground when he says (p. 10) "Roughly 25 per cent replacement of present plant equipment would be necessary to enable plants to run efficiently at the present 100 per cent rating."

• • •

Dies Improve Wire Quality

When this publication, by special permission, on Oct. 11, 1928, presented for the first time in any American periodical the paper by Dr. Samuel L. Hoyt which announced the development of cemented tungsten carbide—revolutionary, new cutting material—some of our readers intimated that we placed undue emphasis upon an untried product. Yet in the six years which have elapsed since that time, most of the high expectations held forth in the early days of tungsten carbide have been fulfilled. For instance, the use of wire drawing dies of this material, which is only one of scores of important applications, has introduced many changes in the process of wire drawing (p. 22), and has enabled wire makers to improve their product to a marked extent.

• • •

From Discovery to Use!

The destiny of new materials always is a fascinating subject. Who can tell, when a new alloy is discovered, how extensive will be its application on a commercial basis? Few can be expected to enjoy the widespread use which followed the introduction of manganese steel, tungsten carbide, the 18-8 alloys, etc., yet many of the lesser known materials fulfill most important roles in industry. The molybdenum-tungsten high speed steel, discovered by Joseph V. Emmons and described by him in 1932 in a paper which won for him the Henry Marion Howe gold medal of the American Society for Metals, now has become a commercialized material (p. 31), produced and sold by six companies under their own tradenames.

E. L. Shaner

Sees Plant Obsolescence Creating Heavy Steel Demand

MODERNIZING American industrial equipment will be an important factor in lifting iron and steel production and in restoring prosperity, in the opinion of Arthur G. McKee, internationally known iron and steel plant engineer, of Arthur G. McKee & Co., Cleveland.

In an interview with STEEL, after commenting on obsolescence in the industry, Mr. McKee said:

"If this rebuilding of the iron and steel industry is to be done it will put an additional load on its own producing capacity, and while I do not know when industry in general is going to get a good start on modernizing and replacing equipment, when it does I anticipate a wilder scramble for equipment than we experienced in the earlier days of the World war."

Vice President Dawes is conservative in his statement that the maximum practial capacity of the steel industry is not more than 85 per cent of the present American Iron and Steel institute's estimate, according to Mr. McKee, referring to a published interview with Dawes.

Would Need Higher Prices

"I know of no positive source with which to check General Dawes' statement," said Mr. McKee, "but from my rather intimate knowledge of the iron and steel industry I believe it is correct, and I am satisfied that to operate at more than 80 per cent of the Institute's capacity rating would require putting in operation a very considerable number of units which are so obsolete, decrepit and inefficient their operation would be possible only at much higher prices.

"From the standpoint of the heavy goods requirements of the country, I would suggest that the iron and steel industry itself is in a condition requiring enormous expenditures for replacement of wornout equipment, the modernizing of obsolete equipment and construction of new plants to operate in accordance with new methods and processes.

"Of course, we have all watched with more or less astonishment large investments in wide strip mills, even long after the capacity of the existing strip mills in the country had passed the possible consumption of this type of goods.

"Wide strip mills now are being built and others are projected involving large investments of new capital, and I hope that all of these investments may prove highly profitable. The fact must not be overlooked, however, that replacements and new plant construction in other fields of the iron and steel industry must be provided in the near future.

"One of the unfortunate features of the situation in the iron and steel industry is that apparently there is no authoritative information available in regard to actual total value of plant and equipment. And, by the same token, there is absolutely no worthwhile information on the present age and condition of this equipment.

"I would say a very considerable part of the present steel industry's equipment was built before, and some of it long before the beginning of the war in 1914. During the war and until 1920, new plant equipment was built hastily and none too well, to take advantage of anticipated profits in the manufacture of munitions.

"Since 1920 there has been little construction of new plants and, at present, it is my impression the average age of plant equipment in the steel industry is between 15 and 20 years. Ignoring minor replacing operations, this average would probably be very close to 20 years.

"The fact of the matter is that capacity really available for immediate production in a large number of plants is much less than claimed for it because parts from one unit have been used for replacement in other units. The units thus robbed cannot be placed in operation again until the parts have been replaced. Depreciation always is at a higher rate on idle units, even though they may not be robbed to keep others running.

"America has boasted for years past of her courageous policy of scrapping old equipment and replacing it with new just as soon as something better has been developed, but the iron and steel industry has fallen behind in this respect during the past 15 years.

"Today a very considerable part of the Institute's 100 per cent capacity is not only decrepit but obsolete, and hundreds of millions of dollars must be spent in the next few years if this industry is to contribute its share to the rebuilding of the industrial equipment of the country, which means operation over a long period as near to our present 100 per cent rating as possible.

Where To Get Capital?

"Of course, before industry can rebuild and modernize its equipment new money must be made available, as industry has been running in the red so long it is simply impossible to finance its own reconstruction from its present current assets. Political interference with the securities markets and financial system has done much to retard the natural course of recovery in the heavy goods industries and the threat of continuing interference is holding the brakes firmly on the wheels of progress.

"If industry could be reassured as to approval by the government and by public sentiment of reasonable profits, and if the present enormous credit possibilities of our banking system could be released from the dam of investment control which is holding them back, capital goods industries would shortly enjoy a period of prosperity which would not only be most gratifying to industry itself but which would absorb promptly, and at good wages, all of those who now are unemployed and really want to work. Just as soon as this condition is provided, our President will have no difficulty in balancing his budget."

"In what departments of the iron and steel industry is obsolescence

Bachrach

Arthur G. McKee

FORTY years experience as a designer, consulting and contracting engineer in the iron and steel industry qualify Mr. McKee to comment on obsolescence in this industry, as he does in the accompanying interview with STEEL. Besides being identified with the construction of many important plants in this country, he has designed and built plants in Russia, India and Canada, and other industrial units in many other foreign countries

most conspicuous?" Mr. McKee was asked.

"It is hard to say, as it is pretty much scattered over the whole industry," he replied. "I do not know about mining equipment, but much of the iron ore handling equipment is nearly worn out.

"Many of the blast furnaces are old in a large percentage of their constituent units. Some of them have old and inefficient boilers and blowing equipment; practically none of them has really modern hot blast stoves.

"Many of the stacks themselves are very old and should be completely rebuilt. A large percentage of them would realize good returns on investments by thoroughly cleaning their blast furnace gas and making it available for firing under coke ovens, and in practically all of the gas consuming furnaces of the steel plants, instead of burning this gas under boilers, as is now being most wastefully done in many plants.

"Many of the open-hearth plants are old and inefficient and should be rebuilt. Aside from the beautiful, elaborate and expensive strip mills which have been built in the past few years, the mill equipment of the country dates back to the war years, and much of it much farther back. I am sure operators will agree with me that many of these mills should be replaced."

Mr. McKee was asked as to the probable cost of modernizing the iron and steel industry, and concerning some reports this cost would amount to more than $4,000,000,000.

Estimate Billion and a Half

"I should be inclined to think that one should not predict or expect investments in replacements and new equipment of more than $1,000,000,000 or $1,500,000,000 in the next five years, but this is a large amount and would contribute enormously to the general objective of re-employment of our idle labor and capital," he said.

"What percentage of physical value of the iron and steel plants today do you suppose would be represented in necessary replacement?" he was asked.

"I would say, roughly, 25 per cent replacement of present plant equipment would be necessary to make it possible for the plants to run efficiently at the present 100 per cent rating, and that undoubtedly a considerably greater amount might well be expended, in order to increase efficiency and take advantage of new developments of the last ten years."

"Is there any justification for the estimate that the cost of bringing the industry up to modern standards would be $4,000,000,000?"

"Frankly, I hesitate to express an opinion," he replied, "for the reason that I do not know what investment would be justified. If the total investment in the iron and steel plant today is $10,000,000,000, I would say $4,000,000,000 is high. The United States Steel corporation started off as a billion dollar corporation and is considered as about half of the industry; that would be two billion invested in the industry. How much that has been increased since the Steel corporation started, I do not know, doubtless considerably. There may be $5,000,000,000 invested."

Obsolescence vs. Production Costs

"Is obsolescence causing high production costs today? If so, approximately how much?" he was asked.

"Undoubtedly obsolescence is a factor in making costs higher, but snap estimates of how much higher would be foolish because the situation is so complicated when you begin talking about obsolescence.

"If you have a plant which is obsolete and not efficient, but which will still run and will still make money at the present market prices, then to destroy that plant and rebuild it with new equipment requires that you write off the present value of the plant; that you write on the cost of the new plant and that your financial overhead on the remaining value in the old plant be added to the financial overhead established by the building of the new plant and charged to the production of the new plant.

"Such a situation is a problem in financing all its own and must be carefully studied before you decide that it is wise to throw away an old plant and build a new one, the product of which must carry the combined financial overhead of both of them. You can't just blandly say that because a thing is old you should throw it away.

"Of course, a plant which is so obsolete it cannot operate at a profit except when prices are abnormally high is a different matter and should be written off in toto."

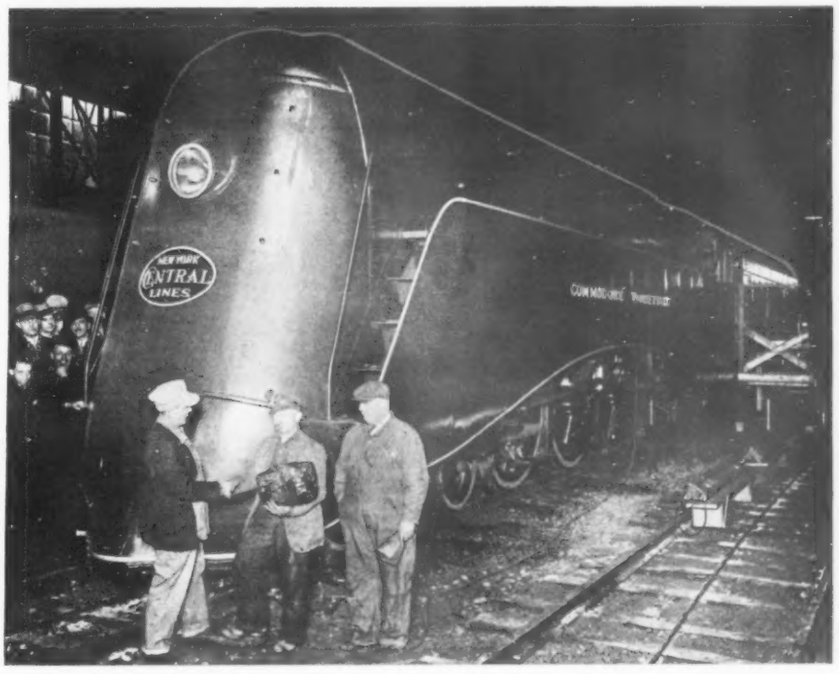
"Is finished steel capacity overbuilt in relation to raw steel capacity?" he was asked.

"It is always necessary to have more total finishing capacity than your ingot capacity because no plant and no company can so arrange its sales to distribute or manufacture those sales so as to have every finishing unit in full operation," said Mr. McKee.

"For that reason it is necessary to have more finishing capacity in total than the steel capacity, just as a central power station has a maximum capacity of probably only a small percentage of the total possible load in connected motors, lighting, etc.

"Progress in this country is not

Industrial Twins—Steel and Coal



When the New York Central railroad's first streamlined locomotive visited Pittsburgh a miner appropriately posed in front of it holding a lump of soft coal. This typified western Pennsylvania's industrial strength—steel and coal. Deriving so much of its revenue from coal, the New York Central is resolved to push streamlining of steam locomotives in preference to adopting diesel or electric power

stopped. Industrial demand for heavy and other capital goods fundamentally has always been increasing. The steel industry in particular has been the victim of waves of prosperity and large demands, with intervening periods of depression. Someone has aptly described this as the characteristic feast or famine of the steel industry. But these waves always have gone to new heights, and again will carry us to higher outputs and increased capacities.

Demand Currently Improving

"Present demand for industrial equipment is accelerating at a rapid rate. I have been making inquiries in various industries supplying capital goods, and without exception have reports of marked improvement in demand for capital goods.

"It is true that when the depression came it was generally said industry had over-expanded capacity. But, bear in mind we have never had a period of prosperity when we have not overbuilt capacity beyond the requirements of succeeding depressions. It has always been the cry in depressions that it would be a long time before demand again would utilize this capacity. The next wave of prosperity, however, always found the capacity then available inadequate to meet the new demands. It is my firm belief this again will be the case."

LEEWAY FOR OBSOLESCENCE

American Iron and Steel institute takes issue with the statement of Gen. Charles G. Dawes, former vice president, that so much obsolete equipment is included in capacity figures that the industry will be operating full when it reaches 85 to 90 per cent of the present rating. (See preceding article by Arthur G. McKee and STEEL for Jan. 21, p.14.)

Records of each steel plant are examined by a special Institute committee, all obsolete capacity is rejected and, in order to be on the conservative side, an arbitrary allowance of 12½ per cent is made for idle time due to repairs and other emergencies—so the Institute contends. On this basis, the ingot capacity of the country of approximately 67,290,000 tons is actually 12½ per cent lower than if no such allowance were made.

In rebuttal, General Dawes last week stuck to his guns but disclaimed any criticism of the Institute.

Foreign Trade

SECRETARY of State Hull has announced a hearing will be held on March 11 in connection with negotiations for a reciprocal trade agreement with Italy. A similar hearing for Canada will be held March 18.

Federal Security Plan May Supplant Steel Ones; Corp. Paying $8,000,000

(The editors of STEEL *asked their representatives at Pittsburgh, Chicago and New York to take soundings on the Roosevelt security plan. Following are the opinions they developed)*

PITTSBURGH ANALYZES CORP. PLAN, OLDEST AND BIGGEST

UNITED STATES STEEL CORP.—largest pensioner in the steel industry—finds carrying the responsibility of some 12,316 veteran employes a burden to the extent that in 1934 it was obliged to make a cash outlay for pensions alone of $7,768,912.

The Steel corporation's reaction to impending federally-sponsored old-age insurance may be expected to be the same as that of other steel companies which in the past have long taken a solicitous attitude toward their veterans.

For, it is only obvious that if federal old-age legislation comes to pass—and steel executives have few doubts that at least a form of it will—the pensioning steel companies can only be expected to contribute to one or the other. And, if federal legislation is to become compulsory, obviously, private pension initiative will soon fall by the wayside.

The Steel corporation has been proud of its institutional pension record. The plan was initiated in 1911 by the late Andrew Carnegie, who set aside a fund of $4,000,000 for the purpose. To this the Steel corporation added $8,000,000, but all pension payments in the interim—from 1911 through 1934—have aggregated over $56,000,000. This excess, excluding interest on the original fund, has always been paid in cash out of earnings, or in the past several years, out of surplus.

At no time has the Steel corporation's pension fund been contributory on the part of the prospective beneficiary. As amended May 1, 1931, pensions for men are compulsory at age 70, or optional at age 65. In both cases, 25 years or longer service is requisite. Pensions for women begin at 60 and 55 years, respectively. Thereupon, the pensioner receives for each year of service 1 per cent of his average monthly pay received during his last ten years of service.

Average $45 Monthly

The Steel corporation has found that the average length of service from 1911 to 1934 has been over 32 years, that the average pensioner's age is over 64, and that the average monthly pension is approximately $45. The latter, however, underwent reductions ranging from 10 to 25 per cent at the time of the steel industry's first and most sweeping general salary cut in 1932.

Employes of 57 different operating, holding, railroad and land subsidiaries the Steel corporation benefit under this plan, although veterans of the Carnegie Steel Co., an operating company, benefit to the greatest aggregate cash extent owing to the fact of its longer existence. In 1934 there was a net increase of 86 new pensioners in the Steel corporation's roll, although the net has been declining for the past several years owing to increasing deaths.

Steel producers approached last week on the soundness and feasibility of old-age pensions for steel employes generally looked askance at any compulsory legislation, unless the experience of insurance actuaries were soundly considered. Then, they considered that to have any value, and if the plan were to embrace all employes, it would have to be contributory both to inculcate responsibility on the part of the potential beneficiary and also to alleviate the pension-givers' obviously heavier burden.

CHICAGO FEARS BURDEN

IRON and steel producers of the Chicago district are inclined to withhold comment on the administration's social security program.

Steelmaking Center of U.S. Is in Northern Ohio

TWO small gray iron foundries constitute the participation of Crestline, O., in the iron and steel industry, but statistically it is the center of the steel industry of the United States.

Taking into account all open-hearth and bessemer capacity, the American Iron and Steel institute calculates the geographical center, or the center of gravity, of the industry at a point a little north and west of Crestline which is 65 miles due west of Massillon and about 75 miles southwest of Cleveland.

In 1923 the center was a few miles due east, near Hayesville, Ashland county, Ohio, and in 1913 it was in Wayne county, Ohio. For a half century the pull has been almost due west.

The center of population of the United States is in southwestern Indiana, several hundred miles southwest of the steel center.

The general impression is that passage of the measures in their present or revised form is probable but that in view of the growing tendency recently toward the adoption of some sort of an insurance plan for unemployment and old age, the eventual adoption of some such program was inevitable.

The present consideration of employers is that the burden not be made too severe in relation to their capacity to assume such expense. Agitation to make payments larger than those set up under the original plan provokes this thought. Subsidiaries of the United States Steel Corp. comprise most of the large interests in Chicago now operating under a retirement pension plan.

NEW YORK SEES SLOW RETREAT

EFFECT of the proposed federal program for social security, once it is put into effect, will be to greatly modify, if not entirely submerge, most features of existing pension plans in the steel and metal working industries, according to competent opinion in eastern steel circles. However, until details of the proposal become definitely settled and an opportunity has been afforded to study their effects, few changes in current policies are expected.

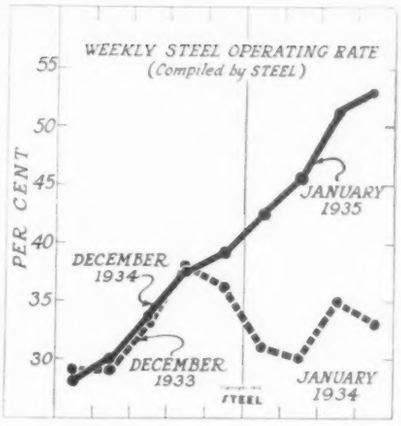
As the federal social security program has been proposed by President Roosevelt, advantages to the employe now working under a company pension system in the steel industry will be fully as great, and in certain respects greater, under the proposed legislation, the belief at the moment is that there will be a slow withdrawal of company pension benefits as the government program becomes operative so as not to work hardship or injustice upon any employe, and particularly upon those who have given long years of faithful service to a company. But the details are yet to be worked out, and cannot be worked out until the legislation takes more definite form.

Production

UP 2 POINTS last week, steelmaking activity rose to 53 per cent, or the highest since the third week of June. Except a reduction at Cleveland, where an open hearth was taken off for repairs, and a static condition in New England, every district increased last week. However, both Youngstown and New England are easier at the beginning of this week but probably will be offset by further improvement in other districts.

There is widespread discussion whether the remarkable rise in steel plant activity since Dec. 1 rests only upon a foundation of automotive demand. On this point, the two accompanying charts are enlightening.

A year ago, the ingot rate showed



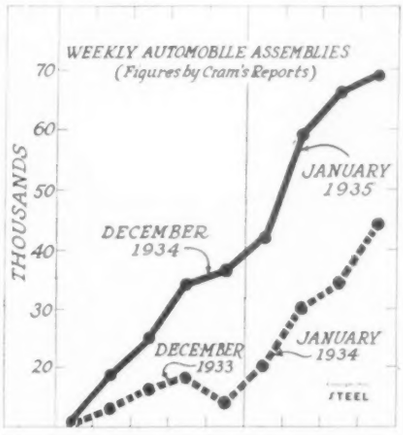
a net gain from 29 per cent to 33 between Dec. 1 and the last week of January, an increase of 14 per cent. This season, in the same period, the steel rate has jumped from 28 per cent to 53, or a net increase of 89 per cent.

A year ago assemblies of automobiles expanded from 10,000 weekly at the beginning of December to 44,800 at the close of January, an increase of 287 per cent. This year the expansion was from 11,400 units in early December to 69,400 or 510 per cent. Thus the increase in automotive production, and presumably in requirements for steel, has shot up much faster than the steel rate.

On the other hand, the spread of steel production this year over last is 60 per cent, while the spread of automobile production over last year is 54 per cent.

Detroit is the first district to achieve 100 per cent operations, all open hearths of the Ford Motor Co. and Great Lakes Steel Corp. now being on; the 400-ton furnace at Fords is excluded because it duplexes. A close second is Wheeling, now at 95 per cent, with 33 out of 37 open hearths active.

Up 5 points, Pittsburgh reached 38 per cent last week and may reach 40 this week. Twenty-one blast furnaces are now active, an increase of four. At Chicago, a 3-point gain put the



rate up to 59 per cent, a new high since June. The increase there, where 13 out of 36 steelworks blast furnaces are active, is flattening out. Jones & Laughlin Steel Corp. is lighting another blast furnace.

Suspension of three open hearths at one plant in eastern Pennsylvania last week was more than offset by increases at two other plants, making the rate there 28½ per cent. Spring wire and tin plate activity is noteworthy. New England held last week at 68 per cent and may recede slightly this week; seven open hearths are in production.

Because Otis Steel Co. took out an open hearth for repairs, the Cleveland-Lorain district dropped 3 points to 79 per cent; Corrigan-McKinney has 13 out of 14 furnaces on, and National Tube at Lorain 11. Otis Steel Co. is lighting a blast furnace.

Buffalo, like Chicago, reached a new high since June when its plants advanced 2 points to 44 per cent; 16 open hearths are on, and more may become active before February. Birmingham pushed up 2½ points to 31½ per cent, as seven open hearths are being tapped in that district.

Youngstown gained 4 points last week to 64 per cent, and will probably open this week at 63 per cent, down 1 point. However, a rebound to above 65 per cent is expected later in the week, owing to greater output of pig iron. Youngstown Sheet & Tube Co. is blowing in a blast furnace at its Hubbard works which has been idle a year.

Steelmaking Operations

Percentage of open-hearth ingot capacity engaged in 10 representative districts

	Week ended Jan. 26	Change	Same week 1934	Same week 1933
Pittsburgh	38	+ 5	22	16
Chicago	59	+ 3	30	15
Eastern Pa.	28½	+ 1	23½	13
Youngstown	64	+ 4	32	15
Wheeling	95	+ 5	64	†
Cleveland	79	— 3	64	41
Buffalo	44	+ 2	32	22
Birmingham	31½	+ 2½	52	30
New England	68	None	86	†
Detroit	100	+29	46	†
Weighted aver.	53	+ 2	33	19

†Not reported in 1933.

Aluminum Threatens Steel

New York city bridge engineers have been studying the possibility of using aluminum to lighten the Brooklyn bridge, similar in plan to a weight-saving rebuilding that Pittsburgh undertook on the Smithfield street bridge, Pittsburgh, recently.

Allis-Chalmers' Open House Proves Mechanical Pageant of Progress

ALLIS-CHALMERS MFG. CO. was host to more than 30,000 persons on Jan. 19, when it held an open house at West Allis, Wis., to permit the inspection of products and manufacturing practices of the company. Work in process was described, the plant not being in operation.

Of chief interest were the four hydraulic turbines now being built for installation at Boulder dam. Each of these will develop 150,000 horsepower, said to be the largest and most powerful turbines ever built. The turbine casings are 10 feet in diameter at the intake and are built in six sections to permit transportation to the dam site. Each of the four casings weighs about 250 tons. Sixty railroad cars will be required to ship the four units.

Electrical switchgear for the Boulder dam power plant also was exhibited. Latest developments in steam turbine design were exemplified by an 80,000-kilowatt unit just built for the Milwaukee Electric Railway & Light Co. for installation at its Port Washington, Wis., plant. Included among a number of other large engineering units being manufactured were roller gates being fabricated for the Mississippi river dam at Alma, Wis. Each section is 68 feet long and 15 feet in diameter.

In addition to products of the hydraulic turbine and centrifugal pump, electrical and steam turbine departments, equipment developed by the engine and condenser, blower and compressor, milling machinery and tractor departments also was displayed. The tractor department, in addition to demonstrating latest models of Allis-Chalmers tractors and road machinery, also exhibited a variety of farm implements which comprise a part of the company's complete line of equipment necessary in the production of wheat from soil to flour.

About 100 representatives of the press were guests of the management at a luncheon held in connection with the open house. Remarks of welcome were given by Gen. Otto H. Falk, chairman of the board, and Max W. Babb, president of the company.

Steel Index Is Ready

The index to Volume 95 of STEEL, *for the last six months of* 1934, *now is ready for distribution. Copies will be sent to all subscribers requesting them.*

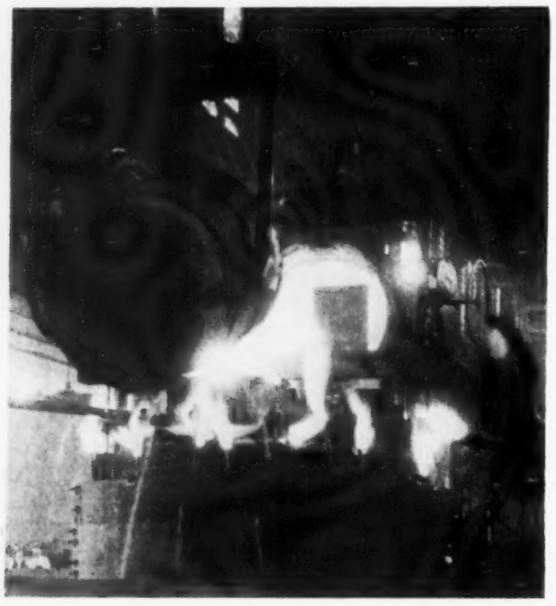
Institute

THREE new resolutions, an amendment to an existing resolution and an amendment to regulations, were made effective by the American Iron and Steel institute, Jan. 24.

The first new resolution, No. A35, has to do with reductions in delivered prices of certain wire products, when such prices are determined on the basis of prices at a Gulf port basing point.

Commercial resolution No. A36 deals with reductions in delivered prices of certain wire products when sold in less-carload quantities. Commercial resolution No. A37 applies to the qualifications of jobbers of certain wire products. Under this resolution jobbers who comply with all previous qualifications, except that they do not buy in carload lots, are now deemed to be fully qualified as jobbers of the products specified in the resolution.

The amendment is to No. A7 and establishes allowances with respect to sales of products in intrastate commerce within California, Iowa, Kentucky, New Mexico, North Carolina or West Virginia. The remaining amendment affects paragraph 13 of Regulations No. 4. It deals with compilation of ocean, rail-and-ocean and rail-ocean-and-rail freight rates.



Boulder dam may be spectacular, but so also is the process whereby Allis-Chalmers pours castings for turbines and other equipment designed to control and harness the enormous amount of power to be developed there

Labor

STEEL employes received a larger share of the industry's gross sales dollar during the depression than in 1929, when both total production and aggregate payrolls were at a peace-time peak. American Iron and Steel institute estimates employes directly and indirectly required in steel production received in salaries and wages 43 cents out of every dollar realized in gross sales from 1930 through 1933. In 1921 employes' share was 37 cents, in 1918 only 34.

MORE DROP 5-DAY WEEK

Jones & Laughlin Steel Corp. will return to the 5½-day week for its office staff beginning Feb. 2, with a corresponding increase in salaries. United States Steel Corp. subsidiaries, also Republic Steel Corp. and the Youngstown Sheet & Tube Co., have returned to a 5½-day office week.

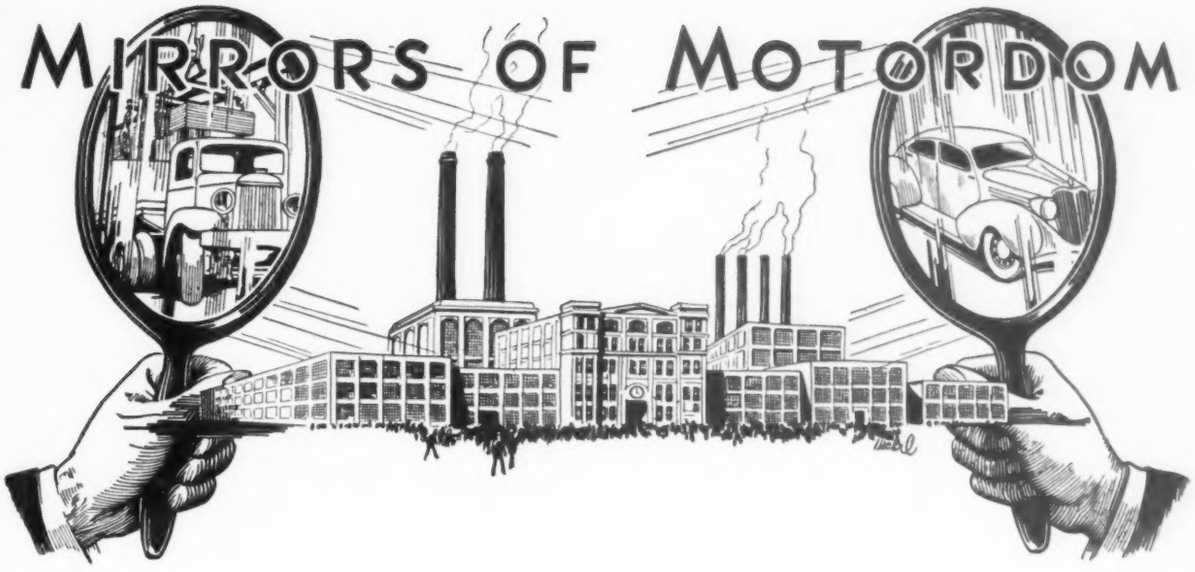
HEARS WHEELING EMPLOYES

Steel labor board Friday heard employes of the Wheeling Steel Corp. at Portsmouth, O., who are members of the Amalgamated Association of Iron, Steel and Tin Workers, testify that the corporation had failed to live up to its agreement made in settling the recent strike and claimed favoritism was shown to company union men.

LABOR BOARD SUED AGAIN

Pittsburgh Steel Co., Pittsburgh, last week joined the parade in petitioning federal court to review an order of the national steel labor rela-

(Please turn to Page 57)



DETROIT

FORD is leading the pack by a substantial margin in the race to attain a rate of production in keeping with the improved status of retail sales. The flow of orders from dealers since late December for all makes of cars has more than justified ambitious plans of manufacturers for first quarter assemblies, and in some cases original schedules have been found inadequate and are being revised upward.

Ford's experience in this respect is particularly noteworthy, and if the present is any criterion, attainment of the 1,000,000-car goal set by this company for 1935 becomes more a probability than a possibility. Since the introduction of new models, Ford's orders have kept well ahead of the rush of buying that greeted the first Model A late in 1927, and deliveries are two to three weeks late.

OPENING IDLE BRANCH PLANTS

February production schedule for the United States, originally set by Ford at 110,000, has been boosted to 130,000, the largest monthly output in nearly five years. The Cincinnati assembly branch will be reopened March 1 for the first time since 1932, with schedules set at 150 units daily. Branches at Memphis, Tenn., and St. Paul also will start assemblies shortly.

Sixteen Ford branches now either are running or are planning to resume operations within a few weeks. Assembly of 500 units daily at the Chicago plant marks the highest rate since the introduction of Model A. For the company as a whole, production is close to 5000 cars and trucks daily, and it is hoped that 800,000 units will have been built by Aug. 1. If this mark is realized, the final lap to 1,000,000 would be merely a jog.

Ford is not alone in attempts to reach a higher operating rate, its record being made more impressive by the fact that its principal competitor, Chevrolet, recently has been subsisting on business for only the standard series. Master models will start coming off the lines next month and will help to boost Chevrolet's output about 50 per cent over the January total. Since Ford's operations recently have been about double those of Chevrolet, the latter is unlikely to match Ford's monthly production before March.

Last-minute changes effected in design of the master models have delayed Chevrolet materially and result in a duplication of the situation a year ago when both Ford and Plymouth pulled away to a long lead in sales in January, only to have Chevrolet pass them in March. Ford's early advantage in passenger car registrations was too much to overcome, however, giving it first place for the year, but second place including truck sales.

Plymouth has been going along at a record clip, capacity schedules giving it an output of more than 12,000 units weekly and recently making it the second largest producer. Retail sales lately have topped 5000 cars for a week, more than three times the number delivered a year ago, while dealers' orders are reported to total around 100,000 units.

SALES DOUBLE 1934 RATE

Pontiac expects to produce 18,000 cars in January, compared with 7700 last year. Part of the gain is accounted for by the fact that the company now has three lines of cars in different price classes, against only one in 1934. Dodge dealers' sales so far this month have more than doubled the 1934 rate, with production around 4900 units a week. Indicative of the trend in retail demand for the industry as a whole, sales at the Detroit show week before last totaled about 2000 cars, or twice the number sold last year.

While gains continue to be noted in production of a number of manufacturers, the increases are smaller than they were early in the month. Possibilities of exceeding the output of January, 1930, of 283,609 units now appear bright, however, and this month seems slated to be the best for January since 1929, when 422,538 cars and trucks were built.

Despite the heavy and sudden demands made on them for prompt shipment, steel mills have done a good job in meeting these heavy requirements and have aided

Automobile Production

Passenger Cars and Trucks—U. S. Only

By Department of Commerce

	1932	1933	1934
Jan.	119,344	128,825	156,907
Feb.	117,418	105,447	231,707
March	118,959	115,272	331,263
April	148,326	176,432	354,745
May	184,295	214,411	331,652
June	183,106	249,727	308,065
July	109,143	229,357	266,576
Aug.	90,325	232,855	234,810
Sept.	84,150	191,800	168,171
Oct.	48,702	134,683	132,491
Nov.	59,557	60,683	78,465
Dec.	107,353	80,656	183,187
Year	1,370,678	1,920,057	2,778,739

Estimated by *Cram's Reports*

Week Ended	
Jan. 5	42,003
Jan. 12	59,725
Jan. 19	66,967
Jan. 26	69,409

considerably in effecting the sharp expansion in assemblies. Additional steel orders placed recently have been heavy and are indicative of the further gain in motor car production expected for February and March.

The practice of automobile manufacturers of slitting wide sheets instead of buying strip is becoming more prevalent. One large interest a short time ago placed material for 17,000 units, but bought only one carload of strip, obtaining its narrow flat-rolled steel by the cutting process. While there is a certain saving in cost of sheets versus strip, disregarding the cost of slitting, the practice also eliminates the necessity of ordering and stocking a variety of widths.

Some manufacturers and parts suppliers continue to purchase flat rolled steel in blanks that are ready for subsequent stamping operations rather than in the form of sheets or strip. While mills do not actively seek this type of business, most of them are equipped to blank out small parts, such as hub caps or motor armature laminations. The saving to consumers comes through the elimination of considerable scrap on which freight charges otherwise would have to be paid.

Packard is just completing installation of equipment for production of its new 120 series and expects to start assemblies next month. Output of 2000 of these cars in February and 4000 cars in March is anticipated. Banks of certain parts now are being accumulated.

NEW, EFFICIENT EQUIPMENT

Separate manufacturing and assembly facilities have been provided in a portion of the plant formerly devoted to body building, so that there is no interference with operations on Packard's other lines. This results in the creation of an entirely new plant, since all machinery and equipment is new or has been rebuilt to provide the last word in metal-working efficiency—an important reason why Packard has been enabled to place relatively low prices on its latest and smallest series of cars.

Lincoln gives no intimation as to when its low-price line will be introduced. Some cars have been built, however, and an announcement is anticipated before spring. Most reports credit the new series with having 12 cylinders and prices of less than $1500.

While the swing in public taste has been to cheaper models since the days when the two-car-garage movement lost vogue, the belief is held by some that the quality car makers are hurting their accustomed market by turning to the fields of greater volume.

It is pointed out that there will always be a class of buyers to whom the prestige of fine car ownership will always be an important consideration, and that a new crop of free-spenders will rise from the depression and will want to express their monetary gains by a display in which expensive automobiles will figure prominently. Whether the appeal of one car is detracted from by the availability of another of the same name at a considerably lower price remains to be seen.

There is a good basis for belief that automobile buying this year will extend more heavily into the higher price brackets. This trend started in 1934 but it failed to make itself felt in the upper reaches; the $1000 to $2000 cars sold somewhat better but registrations of the most expensive makes continued to drop.

No doubt demand for the latter will revive with improved conditions, but, in view of the qualities now built in the moderate and low price vehicles, there is some question whether the difference in performance and riding comfort between the highest and medium price models, such as prevailed five to ten years ago, will be attained again. This circumstance is seen as likely to have an important effect on those buyers to whom prestige and length of car life are not prime considerations.

Plans of the L. A. Young Spring & Wire Corp. to build a wire drawing mill here, active a short time ago, continue shelved.

Died:

MAITLAND M. DUNHAM, 68, special representative of Hammond Iron Works Co., Warren, Pa., in charge of the New York office, in Charlottesville, Va., Jan. 9. Born in Enterprise, Pa., he was one of the best known figures in the iron and steel industry in western Pennsylvania. He was purchasing agent for the Struthers-Wells Co., Warren, Pa., from 1902 to 1919, when he resigned to join the Hammond organization.

□ □ □

William H. Dotter, 68, president of the Frog, Switch & Mfg. Co., Carlisle, Pa., in that city Jan. 19.

□ □ □

George P. Stirm, 55, for 26 years foreman of the Lansing Co., Lansing, Mich., in that city, Jan. 22.

□ □ □

John H. Larmonth, 62, president of Engineering Materials Ltd., Montreal, Que., Jan. 4.

□ □ □

Fred O. Paige, 72, founder of the Paige Motor Car Co., Detroit, in Hollywood, Calif., Jan. 20.

□ □ □

Joseph A. Wangler, 64, former president of the Wangler Boiler & Sheet Iron Co., St. Louis, at his home in Webster Groves, Mo., recently.

□ □ □

William Light, 48, a salesman in the Detroit office of the Jones & Laughlin Steel Corp. since March, 1927, Jan. 24.

□ □ □

Erle W. Bletcher, 36, superintendent of the electrical department of the Pacific Coast Steel Corp., Los Angeles, near Lancaster, Calif., Jan. 17.

□ □ □

Frank A. McDonald, 69, former general superintendent and chief engineer of the National Mining Co., a subsidiary of the United States Steel Corp., in Pittsburgh, Jan. 24.

□ □ □

William G. Spence, 82, for many years vice president of the Rundle-Spence Mfg. Co., Milwaukee, plumbing and heating supplies, until his retirement in 1931, in Milwaukee, Jan. 19.

□ □ □

Frank. J. Frisz, 53, mechanical engineer, A. O. Smith Corp., Milwaukee, Jan. 19. A graduate of Rose Polytechnic institute, Terre Haute, Ind., he joined the Smith organization in 1920. For several years he served as chief estimator.

□ □ □

A. V. Bouillon, for the last ten years technical adviser to the United States shipping board and secretary of the American Marine Standards committee, in Seattle, Jan. 15. He was associated formerly with Morgan Bros. Shipyard, Seattle, as ship designer and engineer.

□ □ □

Oscar P. Snow, 80, prominent foundryman in the Detroit district, in Detroit, Jan. 7. Born in Charles City, Iowa, he later worked in Freeport and Rockford, Ill., and Beloit, Wis. He also was connected with the Nortwestern Foundry Co., Chicago; Detroit Foundry Co.; Challenge Machinery Co., Grand Haven, Mich.; and the Detroit Stoker & Foundry Co. For 20 years he was foundry superintendent for the Ford Motor Co.

Contests

AMERICAN Institute of Steel Construction, 200 Madison avenue, New York, is announcing its seventh annual bridge design competition for engineering and architectural students. The subject is a steel grade crossing elimination bridge. Preliminary drawings must be received by the institute by March 16, preliminary judgment will be rendered March 20, and final judgment May 1.

Industrial Men in the Day's News

W. F. McCarthy, New President, Associated Machine Tool Dealers

—Keystone

Starting as a machinist's apprentice, much of his early training was in the manufacture of bicycles.

For the past 35 years he has been active in sales work with a leading New York machine tool interest.

He devotes much of his time to participation in affairs of the machine tool dealers' organization.

W. F. McCARTHY, recently elected president of the Associated Machine Tool Dealers, is vice president and in charge of sales for Henry Prentiss & Co., New York. Starting as a salesman, he has been with this company for 35 years.

Born at Jamesville, N. Y., he received early experience in the shops as a machinist apprentice. Much of his early training was in the manufacturing of bicycles, which was then an important industry in the Syracuse, N. Y., district. His next position was with the General Electric Co. at Schenectady, N. Y., in the experimental department.

In 1900 he turned to sales work and joined Henry Prentiss & Co., a year later, being appointed manager of a new branch office at Boston. In 1926 he returned to the New York office to become sales manager.

Mr. McCarthy has been active in affairs of the machine tool dealers' association, being a member of the executive committee for several years, and vice president. He resides at Larchmont, N. Y., and is a member of both the Machinery and Engineers clubs in New York.

□ □ □

D. M. Avey, editor, *The Foundry*, Cleveland, and president of the American Foundrymen's association, has been chosen a member of the executive committee of the association. Other members include: Vice President B. H. Johnson, R. D. Wood & Co., Florence, N. J.; Executive Secretary C. E. Hoyt, Chicago; and Directors H. Bornstein, Deere & Co., Moline, Ill., R. J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich.; James L. Wick Jr., Falcon Bronze Co., Youngstown, O.; and Frank J. Lanahan, Fort Pitt Malleable Iron Co., Pittsburgh.

Walter L. Seelbach, Forest City Foundries Co., Cleveland, has been elected a director of the association to fill a vacancy on the board.

□ □ □

R. B. Porter, for some time assistant to the president at the Moxham plant of Lorain Steel Co., Johnstown, Pa., has been appointed general manager of the plant.

D. P. Steward, research engineer, has been named to the post of assistant general superintendent.

E. T. Grubb, acting traffic manager, becomes traffic manager.

J. W. Stanley has been named assistant superintendent in charge of frog and crossing operations.

□ □ □

E. H. Hall, formerly Pittsburgh district distributor for Trabon Lubricating Equipment Co., has been appointed general manager of the company's new plant, 685 West Canfield avenue, Detroit. F. D. Johnson is president; J. N. Fauver vice president.

□ □ □

Walter G. Blume has been appointed assistant manager of sales for Superior Steel Corp., Pittsburgh. He has been with the company for the past 17 years, having started in the company's works at Carnegie, Pa., but in the past ten years has been connected with the sales department in the general offices at Pittsburgh.

William M. Cowles has been appointed eastern manager of sales for Superior. He has been identified with the company for some time in a sales capacity in the New York district, and in his new position also assumes charge of the Philadelphia office, formerly under the supervision of the late John E. Wetzel.

□ □ □

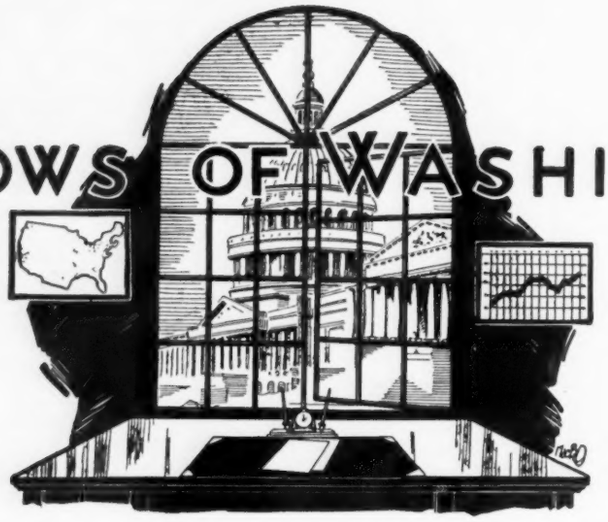
George L. Danforth Jr. has resigned as general superintendent of the South works of Illinois Steel Co., Chicago, to become president of the Open Hearth Combustion Co., Chicago, the latter interest having been organized in 1924 by Mr. Danforth and the H. A. Brassert Co., controlling the Danforth patents and others including those covering the Naismith sloping backwall.

Mr. Danforth has been associated with the steel industry for 37 years, starting in the open-hearth department of the Birmingham Rolling Mill Co. in August, 1897. He has been with the South works organization since 1903, as superintendent of steel production, assistant general superintendent and general superintendent since 1929. He has developed many open-hearth improvements including waste heat boilers, special type regenerators and the venturi port.

George L. Danforth Jr.

Walter Mathesius, assistant general superintendent, succeeds Mr. Danforth at the South works.

WINDOWS OF WASHINGTON



WASHINGTON

AS STEEL production crosses 50 per cent on the way up and automobile assemblies reach a rate of 400,000 monthly, more side glances are being cast at the labor picture. The time is approaching—say within 60 days—when what many regard as labor's last great chance to capitalize its preferred position under the new deal will arrive.

If there were any betting odds they would be heavily against any widespread or serious trouble this spring. The danger—if any—lies in a revolt of radical elements of unions against so-called conservative leadership, which is now actually on foot in steel, and a guerilla warfare which enables a vicious minority to harass a peaceful majority.

LABOR LEADERS FAIL WORKERS

Chameleon-like policies of the new deal make forecasts hazardous, but there seems to be no doubt here that organized labor has shot its bolt and disappointed even its warmest adherents within the administration. It must be conceded that there were some who visualized collective bargaining bringing on an idyllic partnership of labor and capital, of the sort capital itself would welcome, but they idealized labor's leadership.

There has been some loose talk of concerted action this spring by labor in the steel, automobile and textile industries, but the logic is entirely against it. Indeed, the President least of all can afford to have recovery retarded at this time, with the 1936 elections creeping up, and chances are he would take to the radio and denounce any general strike. William Green, if he continued president of the American Federation of Labor, could not do otherwise and remain consistent with his attitude on the general strike at San Francisco.

Organized labor has made a flop of its effort to prove strength in the rubber industry at Akron. Labor's strength in the recent elections at Cadillac and Chevrolet was a fizzle, and the various unions have been bitter against the automobile labor board, on which they have representation. No figures are available, but there is no snap to the formation of federal unions and the federation's income from dues is easing off. The split in the building trades department of the federation has sapped confidence.

For all that the steel industry is disliked in Washington, it has placed itself in an unassailable position by making every reasonable concession for a truce of the kind the President sought last Sept. 30. The only demand not met was for a closed shop. The onus for any warfare in steel is clearly with labor, and so recognized by the administration. Superficially the ukases for elections issued by the national steel labor relations board look bad for the industry, but the board, which recently was granted $33,500 additional by PWA, was following routine.

INTERNAL POLITICS SMOLDER

At the moment, the Amalgamated Association of Iron, Steel and Tin Workers is torn internally by an attempt of "militant leaders" to wrest control from Michael F. Tighe, veteran president. A document circulated by this group criticizes the Tighe leadership, refers to dwindling dues and attendance at meetings, urges that the Smelter and Mine Workers' Industrial Union be brought into the Amalgamated, and hints at building up strength to seize control of the Amalgamated and call a national strike.

Denouncing this document, the Amalgamated terms any merger with the smelter and mine workers' union as a violation of the Amalgamated's constitutional embargo on communists. Whatever the merits of the case, the revolt serves to divide the branch of organized labor in the steel industry and make its efforts more feeble at a time when labor sees an opportunity for earning practically the first substantial pay envelopes during the depression.

It will be interesting to note whether any sense of frustration on the part of organized labor over its lost opportunity under 7a crops out at the industrial recovery board's hearing on labor provisions of a future NRA, to start Wednesday. Steel was not represented at the earlier hearing of NRA on price provisions of codes; presumably it will not discuss labor provisions.

TRY TO PROP UP NRA

Midnight oil was burned at the White House last week as the President and his industrial recovery board applied the pulmotor to NRA. Recognizing that the impression is spreading that NRA is going by default and can be defied with impunity, such as the hotel owners and certain branches of the lumber industry have intimated, the administration is seeking means to regain public acceptance. A wave of enforcement and perhaps the imposition of codes on several recalcitrant industries (not iron and steel) may be expected. Introduction of legislation for continuing NRA may be expedited. . . . The third degree experienced last week by C. L. Bardo, former president of the New York Shipbuilding Corp., is a foretaste of what some steel executives can expect when they are hailed before the senate committee which is investigating the munitions situation. It is understood that Charles M. Schwab and others will be called. The senate committee has received an additional appropriation of $50,000 for its probe. . . . Naval officials have been reading with more technical than literary interest a serial in a popular weekly which discloses more details of naval construction and steel treating than they cared to have made public.

EDITORIAL

Redesigners Apply First Aid To Marketing Problems

IN RECENT years, industry has witnessed the rise of a new profession, which has to do with the design of manufactured products. The few experts who have established reputations in this work are credited with having transformed many slow-selling articles into sales leaders simply by capitalizing on redesign.

The leaders in this profession, who call themselves "industrial designers," are not artists, not engineers, not merchandising experts; however, they do have a working knowledge of these three fundamentals. This, coupled with the faculty of anticipating consumer tastes several years hence, often makes the competent industrial designer an invaluable aid to manufacturers confronted with sluggish sales.

How did the industrial designer come into being? This question can be answered by a brief summary of the evolution of manufactured articles for public consumption. In the pioneering period, the primary concern of manufacturers was the mechanical perfection of their products. Their main effort was exerted in this direction. In time, when the majority of competitors were approaching a common plane in mechanical perfection, some of them began to shift the major emphasis to another factor—quality of material. This was the second phase.

Demand for Lower Prices Brings on Era of Mass Production in Industry

Naturally others followed the lead of the early seekers of higher quality, and, after years of competitive effort in this direction, the products of the various manufacturers again approached a parity as to mechanical perfection and quality of material. The next step introduced the important factor of price. Competition to induce sales through the attraction of low prices in time led to the inauguration of mass production methods of manufacture. This set a new cycle in operation. More efficient manufacture lowered costs, lower selling prices stimulated demand, larger volume again permitted lower unit costs, etc.

But in the course of time, the appeal of price became the common property of the majority of manufacturers, and again a new incentive was sought. It was design, with strong emphasis on appearance. Other things being equal, the product with the most attractive appearance will sell best.

This situation was made to order for the industrial designers. It applies to a wide range of manufactures—adding machines and automobiles, fountain pens and fly swatters, clocks and check writers, washing machines and watches, and so on indefinitely. In all of these products the industrial designer is primarily concerned with appearance and its proper relation to function. In fact, his creed is, "Form must follow function."

Procedure Which Designer Follows Is Striking Example of Co-operative Effort

How does an industrial designer operate? How does a Dreyfuss or a Teague work his miracles in product development?

After signing a contract with a manufacturer, the designer meets with the company's engineers, sales and advertising directors and administrative officers. He seeks their ideas on redesign of the product, on what they think will sell and on what their plant is equipped to build.

With this information in hand, he assembles data on every competitive article on the market. Then he prepares a series of new designs, numbering from 50 to as many as 500, essaying to improve on everything in the competitive field and to embody the ideas of his client's personnel and of his own staff. The resultant designs are submitted to the company executives and studied carefully, one by one, in an attempt to find the one which best satisfies the concepts of everybody concerned. When a satisfactory design has been agreed upon, detailed drawings are prepared under the direction of the designer. Shop drawings are then completed and production started.

This procedure has been followed in the case of many products and with remarkable success. The impetus to increased volume of sales, which has attended these cases of redesign, can be attributed largely to the appeal of the improved appearance of the product. But this is not the sole factor. The procedure by which all of the key men are brought into the picture and their interest concentrated not only on the redesign itself but on the manufacturing, advertising and sales problems incidental to the proper handling of the new product makes for teamwork.

The work of industrial designers provides an important new link between the consuming public and industry. Their efforts should command the interest of producers and fabricators of iron, steel and nonferrous metals because they help to expand the use of these materials.

THE INDUSTRIAL DIAL

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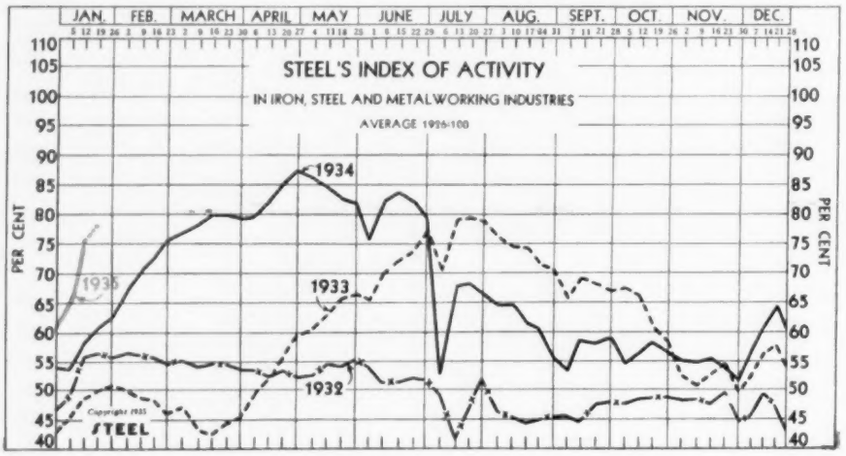


STEEL'S *index of activity in the iron, steel and metalworking industries gained* 4.3 *points to* 78.1 *in the week ending Jan.* 19:

Week ending	1934	1933	1932	1931
Dec. 8	56.8	52.6	46.6	52.9
Dec. 15	60.6	56.0	49.3	53.1
Dec. 22	64.4	58.0	46.9	52.3
Dec. 29	60.8	53.7	42.9	46.8
	1935	1934	1933	1932
Jan. 5	65.4	53.6	45.3	48.8
Jan. 12	73.8†	58.1	48.6	55.8
Jan. 19	78.1*	60.9	49.8	56.2

†Revised. *Preliminary.

December-January Advance Most Rapid in Depression

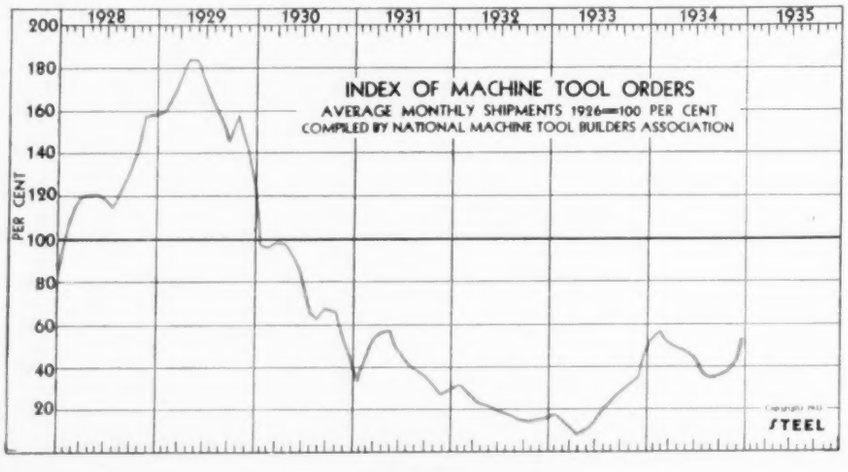
FROM early in December to the present time the rate of acceleration in the expansion of industrial activity has been greater than in any period of the depression.

In six weeks, from the week ending Dec. 8 to that ending Jan. 19, the rate of steelworks operations jumped from 30 to 51 per cent of capacity. In the spurt of 1933 the sharpest rise in a 6-week period was from 14 per cent in the week ending March 25 to 33 per cent in that ending May 6. This was an advance of 19 points against 21 in the current rise. From May 6 to June 17, 1933—another 6-week period—the gain was from 33 to 49 per cent, a slower rate of advance. The sharpest rate of climb in 1934 was from 33 per cent in the week ending Jan. 27 to 51 in the week ending March 10, a gain of 18 points.

The sharp angle of the present advance is even more pronounced in the curve of STEEL's index of activity in the iron, steel and metal-working industries. A glance at the chart at the top of this page shows conclusively that the rise from 51.9 in the week ending Dec. 1, 1934 to 78.1 for the week ending Jan. 19, 1935 represents a higher rate of acceleration than the gains of 1933 or 1934.

However this pace cannot continue. Further advances may be expected, but the rate of gain will be reduced. Evidence of this is found in the smaller gain in steelworks operations in the current week (see p. 43) in the more moderate

1933	
Jan.	18.3
Feb.	15.2
March	11.1
April	8.3
May	10.6
June	15.5
July	22.4
Aug.	27.9
Sept.	30.9
Oct.	33.3
Nov.	38.0
Dec.	51.0


1928 1929 1930 1931 1932 1933 1934 1935
INDEX OF MACHINE TOOL ORDERS
AVERAGE MONTHLY SHIPMENTS 1926=100 PER CENT
COMPILED BY NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
STEEL

1934	
Jan.	56.5
Feb.	58.2
March	50.9
April	48.5
May	46.8
June	42.6
July	38.6
Aug.	37.1
Sept.	37.4
Oct.	40.5
Nov.	44.2
Dec.	54.1

rise in freight car loadings for the week ending Jan. 19, and in the slowing of the pace in other barometers.

Many observers are speculating as to when the peak of the present advance will be reached. In 1931, the upward trend came to a halt on March 21. In 1932 no perceptible rise occurred and in 1933 the bank situation interfered with the mild advance of January and early February. In 1934 the top point was recorded early in May.

The duration of the present advance will depend upon the extent to which various factors bring support to the business structure as the current pace of automobile demand slackens. Plant and equipment rehabilitation is exerting a measure of such support, and probably will continue to do so. The 3-month moving average of the index of machine tool orders compiled by the National Machine Tool Builders' association advanced from 44.2 in November to 54.1 in December. This reflects an extensive and well distributed improvement in demand and places the industry in a more favorable position than at any time in four years.

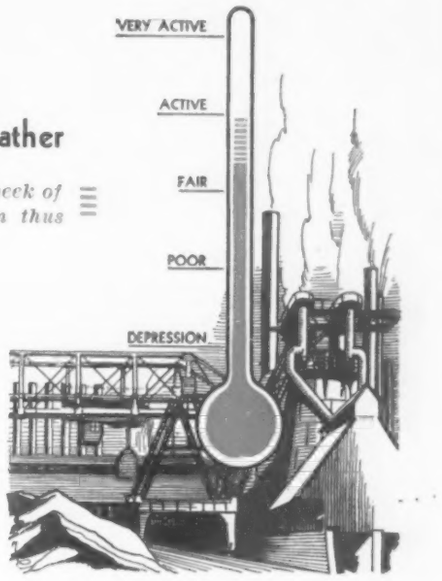
Improvement in the building situation would contribute much to the strength of business generally, but in this field the obstacles of high cost of labor and financing and the confusion of conflicting efforts of agencies trying to solve the numerous problems thus far have retarded progress.

Industrial Weather

Change from last week of December is shown thus ≡

TREND:

Marked Improvement



Where Business Stands

Monthly Average, 1933—100

	Dec., 1934	Nov., 1934	Dec., 1933
Steel Ingot Output	**105.2**	**81.5**	**97.5**
Pig Iron Output	**91.5**	**88.1**	**106.2**
Freight Movement	**94.4**	**105.6**	**92.1**
Building Construction	**75.0**	**104.3**	**93.4**
Automobile Output	.....	**47.5**	**51.8**
Wholesale Prices	**120.7**	**118.2**	**112.3**

The Barometer of Business

Industrial Indicators

	Dec., 1934	Nov., 1934	Dec., 1933
Pig iron output (daily average, tons)	33,153	31,930	38,456
Machine Tool Index	54.1	44.2	51.0
Finished steel shipments (tons)	418,630	366,119	600,639
Ingot output (daily average, tons)	77,645	61,117	71,944
Dodge Bldg. awards in 37 states (sq. ft.)	9,193,300	12,780,800	11,451,500
Automobile output	.....	80,112	87,307
Coal output, tons	31,386,000	30,450,000	30,377,000
Business failures, number	963	923	1,132
Business failures, liabilities	$19,910,610	$18,349,791	$27,240,432
Cement production, Bbls.	.....	5,779,000	3,526,000
Cotton consumption, bales	.....	477,060	348,000
Car loadings (weekly av.)	525,990	588,307	513,090

Foreign Trade

	Dec., 1934	Nov., 1934	Dec., 1933
Exports	.....	$192,321,000	$192,000,000
Imports	.....	$149,412,000	$133,000,000
Gold exports	.....	$310,000	$10,815,000
Gold imports	.....	$121,199,000	$1,687,000

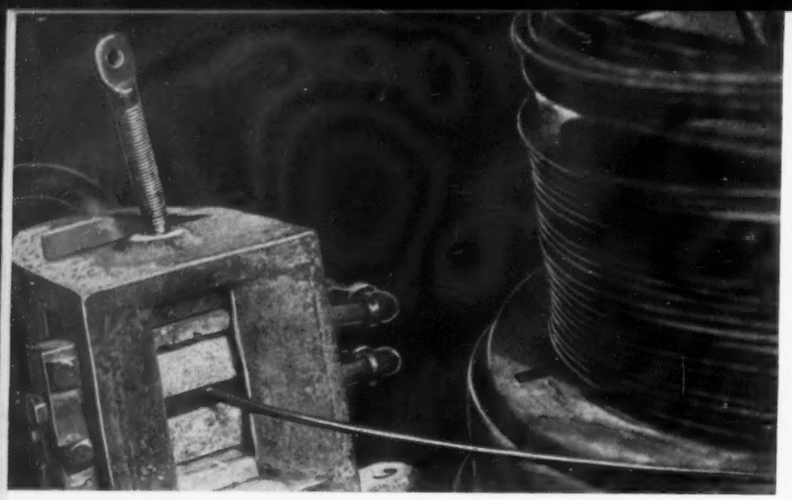
Financial Indicators

	Dec., 1934	Nov., 1934	Dec., 1933
25 Industrial stocks	$141.31	$139.35	$137.01
25 Rail stocks	$28.99	$28.15	$33.04
40 Bonds	$81.75	$80.22	$71.96
Bank clearings (000 omitted)	$19,730,718	$16,758,222	$16,439,217
Commercial paper rate, New York (per cent)	1	1	1½
*Commercial loans (000 omitted)	$7,653,000	$7,705,000	$8,402,000
Federal Reserve ratio, per cent	70.8	70.6	63.9
Railroad earnings	$31,582,703	$48,624,984	$37,565,822
Stock sales, New York stock exchange	23,587,502	20,868,401	34,877,616
Bond sales, par value	$274,105,700	$250,921,900	$279,255,500

*Leading member banks Federal Reserve System.
**November, October and November, respectively.

Commodity Prices

	Dec., 1934	Nov., 1934	Dec., 1933	Monthly Av., 1913
STEEL's composite average of 25 iron and steel prices	$32.39	$32.15	$32.42	$26.32
Bradstreet's index	$9.49	$9.29	$8.83	$9.21
Wheat, cash (bushel)	$1.15	$1.13	$1.02	92c
Corn, cash (bushel)	$1.06	97c	63c	51c
Petroleum, crude (Bbl.)	.....	98c	98c	$2.50



Carbide Dies

Typical installation of a spring bumper to relieve the sudden impact load on cemented carbide dies. This device permits the use of smaller, less costly cemented carbide dies than otherwise would be possible

ONE of the first uses made of metal was in the form of wire, and down through the ages, the uses of wire have steadily multiplied and increased in importance until today, metal consumption in the form of wire, represents a substantial part of our total metal output. Today wire is used in some form by all industries. In some industries wire merits attention only as a factor contributing to general manufacturing operations while in others it is of direct importance due to its use as part of the products manufactured. It is this latter group of manufacturers—those who use wire in their products—who are directly interested in the progress that has been made in wire manufacture through the use of cemented carbide dies.

For at least 100 years, wire has been produced by drawing through dies. During this period improvements have been made in the machines used for drawing wire and in the methods of handling the wire during manufacture, but there has been relatively little improvement in the dies used for producing the wire. Metallurgists have persisted in producing better and more adaptable kinds of wire, but it has been only within the past five or six years, that the most important tool used in the wire mill—the die—has been bettered. About six years ago the cemented tungsten carbide die first was put to use in a general way for wire drawing, (although its use for drawing tungsten filament wire dates back beyond that period), and since that time its use has become almost universal.

The general adoption of carbide dies has resulted in many recognized advantages: The tolerances on wire size have been reduced; the cost of producing wire from rod has been lessened because of the larger yield obtained with a more uniform quality of product; until the advent of the carbide die, much wire was thrown out in the bundling room, while today carloads of wire are to be seen passing through the bundling room without so much as one bundle being set aside as a reject.

Quality and Uniformity Aided

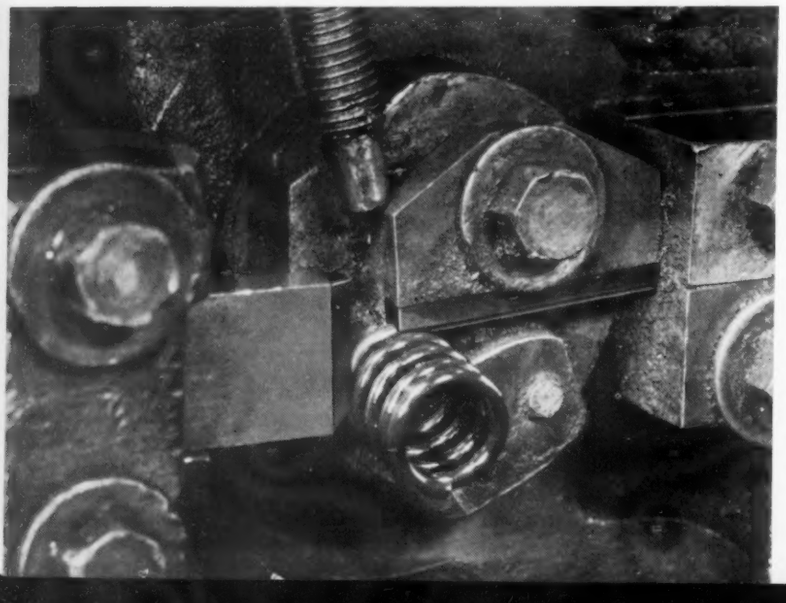
Through the use of carbide dies, the users of wire have been able to obtain a better quality of product which is more nearly on size, and more uniform from one end of the bundle to the other, and the mills have been able to supply this improved wire without increasing costs, and generally with a decreased cost.

One of the first improvements noted in the wire, was the reduction in size variation to the point where both ends of the bundle were of the same size. This has meant a great deal to certain users of wire who buy wire by the ton and sell it by the piece or foot. For instance, the user of 0.099-inch diameter wire, before the advent of carbide dies, allowed the mill plus or minus 0.002-inch on the diameter of the wire. In other words, the wire which this user would receive from the wire mill would vary from 0.097 to 0.101-inch in diameter. Many of the bundles received would vary as much as 0.004-inch in diameter from one end to the other. For every 100 hundred tons of wire manufactured within this range of sizes, each increase of 0.001-inch in diameter makes a difference of 27½ miles in the length of wire received by the customer.

In other words, if the customer received 100 tons of 0.097-inch wire on one shipment, and on the next shipment the wire size was 0.098-inch, he would have 27½ less miles of wire in the second shipment than in the first shipment. It is easy to see, therefore, that holding closer tolerances on the diameter of the wire, means more miles of fence to the fencemaker, more springs to the springmaker, more squares of road mat to the roadmaker, and more actual footage of wire for all users per ton of wire purchased.

The foregoing briefly outlines the general benefits obtained through carbide die use. The value of these benefits to wire users and wire manufacturers in general is obvious. However, it might be of interest to point out a few instances wherein these general benefits, plus additional advantageous factors, have resulted in specific improvements on individual products:

In the case of spring manufacturers, the important result of using wire drawn through carbide dies is that the torsional strength of such wire is practically the same from one end of the bundle to the other, whereas with the old chilled iron or steel die, there was a wide variation in torsional strength in some bundles, from one end to the other. For the springmaker this means that when a new bundle of wire is started



Carboloy tipped wire guides which saved 40 to 50 hours of regrinding and idle time on a run of 500,000 springs

Contribute to Better Wire Drawing

BY JAMES R. LONGWELL
Carboloy Co. Inc., Detroit

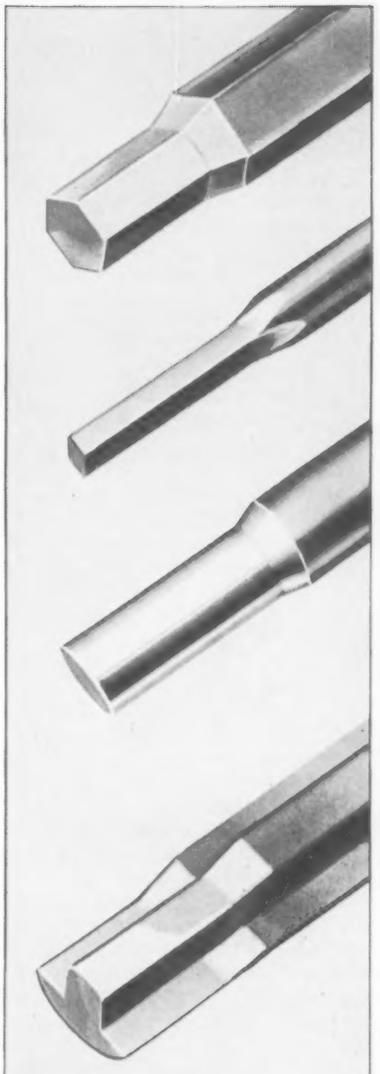
on the spring coiler, uniform springs are obtained from the start, whereas, with wire drawn through the old type of die, springs made from both the first few feet and the last few feet of the bundle usually were lost, because of the nonuniformity of the wire. The springmaker thus obtains a more uniform and a more economical product. This product has been improved further by using carbide wire guides, pitch tools and coiling arbors.

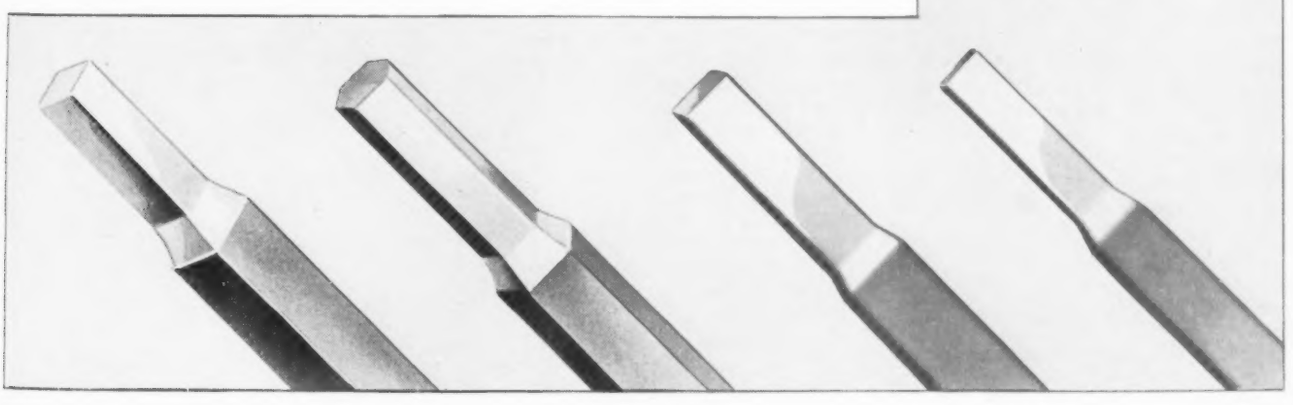
Draw Angular Sections

Manufacturers, when designing their electrical equipment, often find that the available space is limited. This makes it advisable to use square or rectangular wire in place of round wire for coils, in order to get the maximum amount of copper in a small space. For some time it has been the practice to draw round wire and then roll it on a small rolling mill, to the section desired. The radius on the corners of the rolled section never blended exactly into the sides of the section, and as a result the sharp line cut the paper insulation. With the carbide die it is possible to draw square and some rectangular sections in one pass from the round, and the copper will fill out in the die so that there is a perfect blend between the flats and the radius.

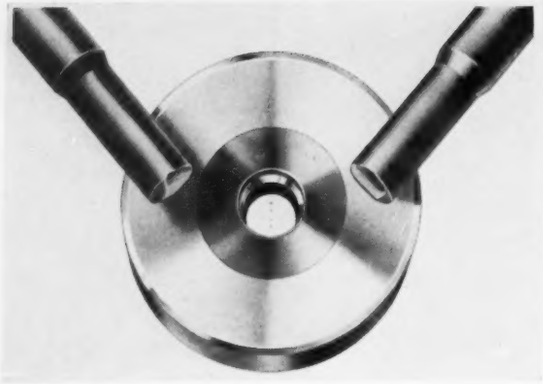
The bolt and nut maker has been able to improve his product through the use of wire drawn through carbide dies. The close tolerance to which the wire can be held allows the boltmaker to use much less clearance in his header and trimmer dies, with the result that more life is obtained from these dies, and more production per machine hour. At the same time the better finish on the wire gives a better finish on the shank of the bolts. The boltmaker who uses rolled threads, may extrude the thread end of the bolt through a carbide die; the use of carbide extruding dies will allow him to reduce the cost and improve the quality. The extruded section stays on size for more than a million pieces, so that the pitch diameter of his bolt is more accurate. The extruded end of the bolt is usually more nearly concentric with the shank which results in longer life of the threading dies, as well as better threads.

The carbide die is used to size bolts which previously were ground, and it is possible to do this during the extruding operation, so that the shank is reduced in diameter just enough to clean it up. The finish is practically as good as the ground finish, and it is not necessary to neck the bolt underneath the head. The maker of cold punched, hot punched or forged nuts, may use the carbide die to burnish the flats, bring the corners up to a sharp edge, and hold the dimension across the





Representative shapes drawn through cemented carbide sectional dies



Example of close tolerances held with carbide dies on extrusion work. Piece at left is first out of die; size 0.3638-inch. Piece at right is 1,900,00th out of die; size 0.3639-inch —a wear of 0.0001-inch

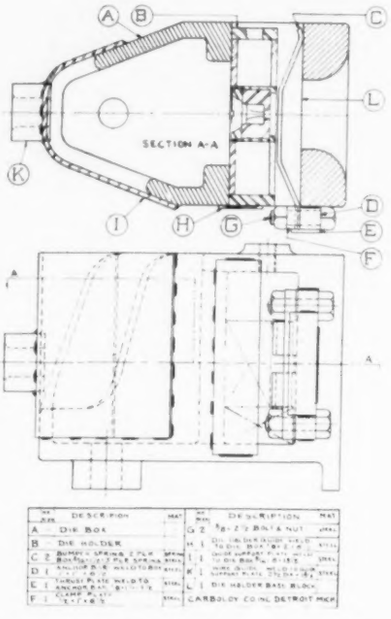
flats within close limits, so that the user of the nuts finds that the wrench fits the nuts better and there is not as much chance to mutilate the nuts when tightening them. Further, the appearance of the nut is improved.

These are but a few specific cases wherein the use of wire drawn through carbide dies has enabled the wire products manufacturer to improve his product, and effect economies. They are sufficient, however, to give some indication of the benefits which are the direct result of carbide die use.

Aim To Increase Production

Both the carbide die manufacturer and the carbide die user constantly are endeavoring to improve the results obtained from this relatively new material. In the wire mill, many ways have been found to obtain more and more wire per die. Naturally, this was to be expected since dies costing about $0.05 each, have been replaced with dies which cost from $5.00 to $50.00 each. The preparation of the rod and wire for drawing was bettered in the cleaning house, as one of the first measures. Cooling the dies either with water or low-pressure air removes the excess heat which otherwise would burn the lubricant, reduces die wear, practically eliminates scratched wire and breaks, and allows the wire drawer to increase production. This cooling also helps to improve the torsional strength of high-carbon wire.

Most mills have many drawing blocks which start quickly and reach drawing speed almost instantly. On this type of block the carbide die is subjected to a heavy impact load each time the block is started. This impact load largely can be eliminated either by using a spring bumper between the die holder and the die box, or by mounting the die box on a slide which is connected through springs to the frame so that when the block starts, the die box will pull ahead until the load carried by the springs catches up with the draw pull. In practice this has proved to be an economical procedure. The spring bumper arrangement, illustrated herewith, shows that it is a relatively simple matter to make use of this appliance. The savings obtained



Spring bumper, showing various details of design

through its use assuredly indicate that it is a factor worthy of consideration. In one mill for example, the use of this spring bumper to absorb the impact load, enabled them to substitute a die costing $20.80 for a $51.00 die—a saving of $30.00 on each die purchased.

With the old type of chilled iron or steel die, it was necessary to carry a fairly heavy sul coat when finishing one bundle of wire within the tolerances allowed. Where this wire subsequently was coated, it was necessary for the cleaning tanks to remove the sul and lime before the wire entered the hot metal. With the advent of carbide dies, mills have reduced the amount of sul coat, and have used the die to clean the wire, so that the wire going to the cleaning pans, practically is free from sul and lime coats. The result has been less contamination of the coating material and a coated wire which had a much improved appearance. Naturally, using the die to clean the wire reduced the production per 0.001-inch die wear, but the saving obtained in subsequent operations more than offset the cost of this increased die wear.

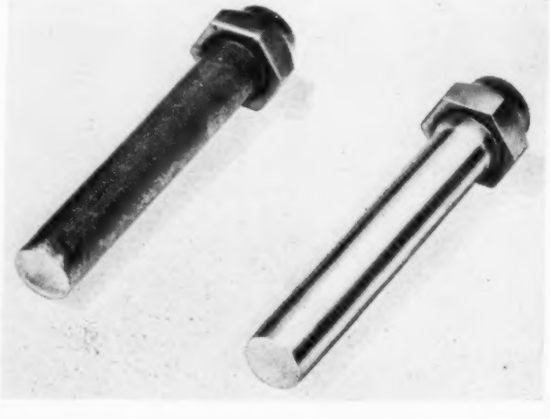
Changes in Equipment Made

Some mills have revamped the die boxes so that the die is lined up properly when the die holder is placed in the die box, as the holder can only be set in the die box in one position. Positive adjustment of the die box by means of threaded stop pins, has made it possible to obtain quickly and accurately the correct "lie" on spring wire. This has eliminated excessive "offset" of dies and in turn reduced the heat generated, thereby increasing torsional strength in the wire and reducing die wear caused by burned lubricant.

The high red hardness of carbide dies makes it possible to draw wire hot and considerable thought is being given to this phase of wire drawing. This practice will eliminate annealing and patenting furnaces and largely, if not altogether, eliminate the cleaning house. Of course, it may be necessary to take the final drafts cold to obtain physicals, but quenching the wire as it leaves the die makes it possible

(Please turn to Page 42)

Close tolerance to which wire can be held with carbide dies allows less clearance in header and trimmer dies thus resulting in longer die life, more production per machine and better finish on shank of bolt



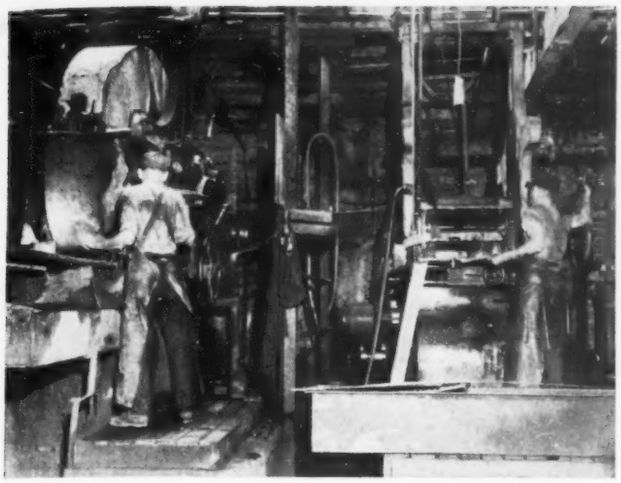


Fig. 1—Machines equipped with one or two stones are used for grinding flat or tapered cross-cut saws

Grinding Equipment Aids Saw Makers

Fig. 2—This machine provides uniform taper on the saw from toothed edge to the back along its entire length

SAW making, while taking advantage of much modern equipment, still relies on the skilled eyes and hands of craftsmen to provide those final touches which are essential in manufacturing quality saws that must meet the approval of other skilled artisans such as cabinet makers, lumberjacks, timber mill sawyers, and other workers in wood—not to forget those who saw metal.

Such saws must cut perfectly straight, and perform their work rapidly whether they are small hand type or huge band type a foot deep and 50 feet long. The ultimate perfection in ability to saw straight is imparted to saws by a hand operation termed *tensioning* which essentially consists of cold-working the blade, disk, or band by deft application of hammer blows at various points until a perfectly plane surface results.

E. C. Atkins & Co., Indianapolis, is a leading manufacturer of saws and circular knives, producing over a hundred different types of saws. Most of the employes are highly skilled and it is of interest to point out that approximately 50 per cent of the men have been associated with the company at least 25 years, and 80 per cent for 15 years.

Extensive laboratory facilities are available both for chemical and physical investigations. In those departments are conducted the regular routine analyses of the steels employed, checking control of the various processes in saw making, and in addition much research and development work in saw and circular knife production. All steels used are purchased on specifications issued by the laboratory.

Making a Cross-Cut Blade

Numerous operations are performed in making cross-cut saws, and it may be well to follow the various steps. The first operation, of course, is shearing or cutting out the saw from the sheet. That is performed on shearing machines equipped with curved dies to provide the correct curvature on the cutting edge of the saw blade. Then the teeth are formed by punching or stamping on presses. Many operations are required before the tooth-forming operation is completed, and as may be expected there are a wide variety of tooth forms to meet the wide range of ideas on the best types for sawing the different kinds of wood available.

After the teeth are stamped, the blades are inspected carefully. Then they are heat treated in specially constructed furnaces equipped with electrically controlled timing devices which indicate to the operator when the saw blades have reached the correct temperature. The blades are removed from the furnace, quenched in oil and, after cleaning thoroughly in sawdust, drawn in furnaces equipped with fixtures to hold the work flat.

Following the heat treatment, the blades are inspected to see that they meet the brinell hardness specifications, and also that no defects are present. Then the blades are sent to the saw makers who make them perfectly flat by hammering the surface at various points. Saw making or tensioning is an operation that results from years of experience, and is performed by hand. It is surprising how quickly a saw maker can make a warped saw blade so straight that light will not show between the straight-edge and the blade.

When the blade leaves the saw maker's hands it is ready for the grinding operations. Fig. 1 shows two types of machines used in this process. The machine at the left carries two stones, one above the other, and the grinding operation is accomplished by passing the saw between the two stones by means of rolls.

The machine at the right is a single stone machine carrying a grind stone below a head block, and the grinding operation is accomplished by passing the saw between

the stone and the head block by means of rolls. This machine grinds one side of the saw at a time. Both of these machines are designed so that they can be used either for grinding a flat saw, or a saw that is tapered from the toothed edge to the back and the rolls are arranged so that the saw will be carried through on the arc of a circle, the diameter of which is equal to the circle on the toothed edge of the saw. In this manner a true taper is imparted to the saw from toothed edge to back.

Both these machines shown in Fig. 1 at times are used for a rough break-down to be followed by a finish grind on a machine such as illustrated in Fig. 2, which is designed so that it will provide a uniform taper on both sides of the saw, one operation, making the saw uniformly tapered from toothed edge to back throughout its entire length.

This machine employs two cup grinding wheels, each wheel driven individually, the wheels being mounted on spindles which may be adjusted in a vertical arc to accommodate the taper grinding. The machine is also equipped with reversible motors operating automatically so that the blades can be fed through the machine forward and back until the saw is finished. The wheels used in this machine are 22-inch diameter, 46 grit, grade "I."

After the blades are ground to the proper gage, both on the toothed edge and back, the sides of the blades are polished. In this polishing operation large, wide leather faced wheels are employed. The operation is similar to that shown in Fig. 3 which illustrates the same operation being performed on a hand saw blade. In this polishing machine the wheel is mounted above two small rollers which carry the blade between the roller and the wheel. No abrasive is applied to the wheel face; instead, the polishing action is obtained by the operator covering the surface of the saw with fine abrasive polishing material as the saw is fed under the wheel.

Any Distortion Removed

Following the grinding and polishing operations the blades are apt to be more less distorted by the abrasive action and it is necessary to return the blades to the sawsmith who readjusts the leveling and tension. The blades are then put through a second polishing operation as shown in Fig. 3 on a finer abrasive, then proceeding to another operation where the gullets of the teeth are ground cut on a special internal grinding machine so that a smooth finish will be obtained to curl the shaving cut by the saw when it is in use.

The cutting edges of the teeth then are sharpened by hand or on a special filing machine. They are then set. This operation consists in slightly bending the alternate teeth in opposite directions in order to afford proper clearance to the saw in cutting timber.

While the description given primarily relates to methods of making cross cut saws, those employed in making band saws, circular saws and hand saws are similar and vary only in detail. Teeth of hand saws usually are ground or filed on automatic machines which are self indexing. The teeth are set either by hand or on machines. In hand setting the operator uses a small hammer to strike each alternate tooth of the blade which rests on a flat steel block with the teeth extending over the edge.

He goes down one side, then turns the blade over and goes down the other side, striking the alternate teeth. It is surprising how rapidly the work is performed, and how accurately. Every blow struck with the hammer hits a tooth and bends it the proper distance. Saw setting machines perform the same operation except that the hammer is machine driven.

Some hand saws receive an additional polishing operation to provide a special surface effect. In Fig. 4 is shown the method for producing a wavy surface. The machine employs

(Please turn to Page 42)

Fig. 3—After grinding to the proper gage the saw blades are polished carefully to obtain a fine surface finish

Fig. 4—Occasionally special surface finishes are desired, the machine here being used for imparting a waved finish

One-Piece Track Assembly of Manganese Steel

COMBINING the proved wear-resisting qualities of 12.5 per cent manganese steel with the high strength and other favorable characteristics of one-piece all-steel construction, a new type of track assembly for frogs, mates and crossings has been developed by Wm. Wharton Jr. & Co. Inc., Easton, Pa., subsidiary company of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

The series of illustrations at the right shows the various steps in assembling a track frog by this method. At the top, two open-hearth steel rails have been specially machined and dovetailed to fit together snugly.

The second illustration shows the two rails fitted together and welded with manganese welding rod. In this view also are shown the manganese steel body which fits over the joint, and steel paving blocks, reinforcing plates and fillers used in the assembly.

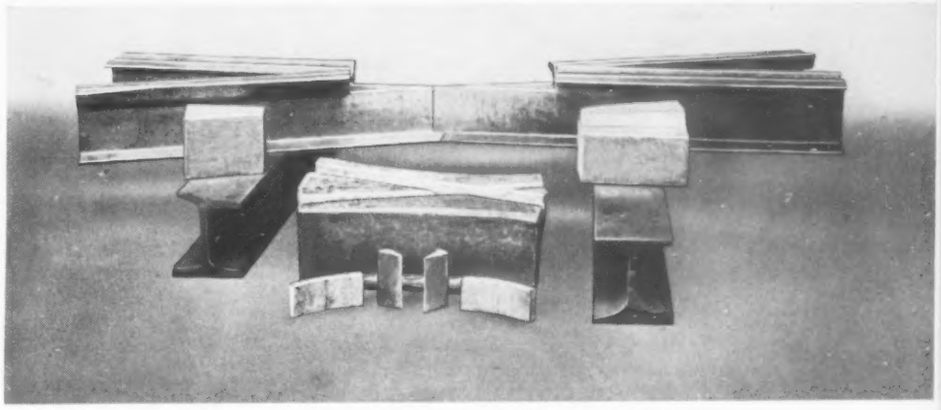
The third illustration shows how the forged steel reinforcing plates are welded to the rail.

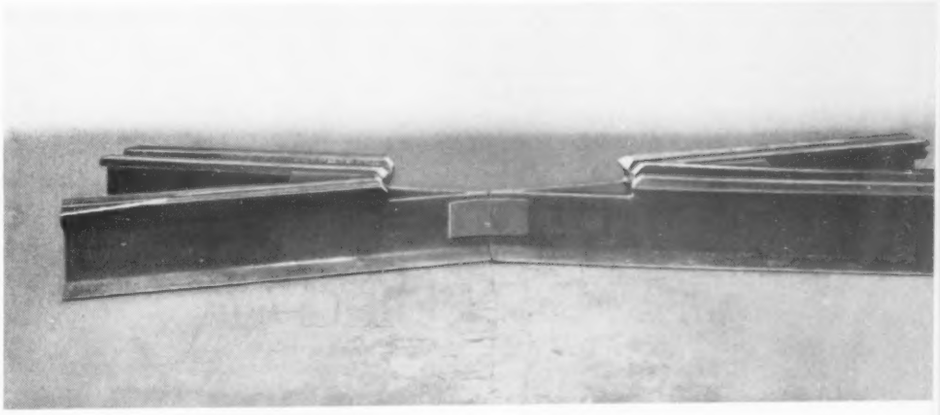
In the fourth view the manganese steel body is being fitted over the two previously interlocked and welded rails.

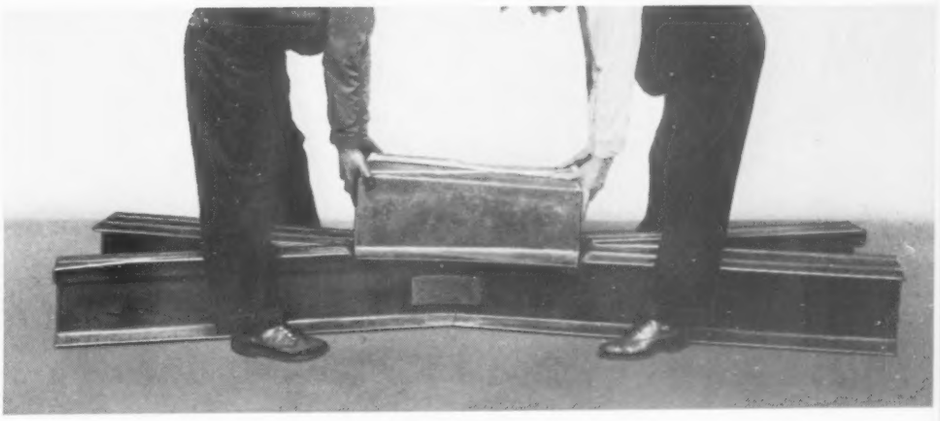
In the bottom illustration, an operator is arc welding the manganese steel body to the through rails at all points of contact, using manganese steel welding rod. Following this final welding, the surfaces are ground to an accurate level with the rail arms.

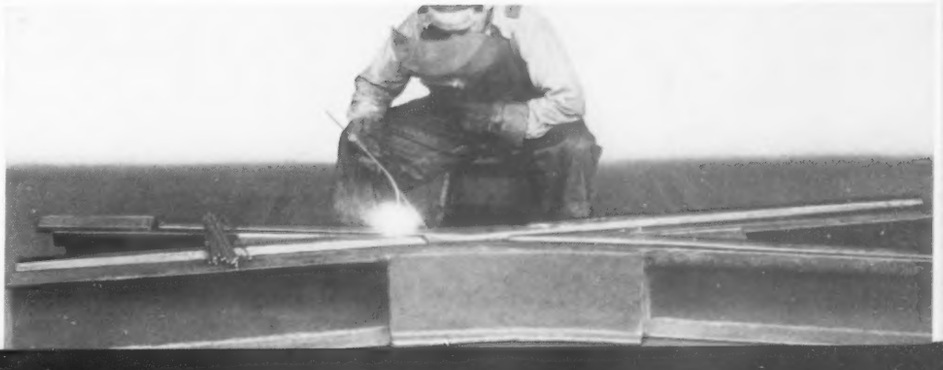
Develop Special Weld Technique

It is not possible to use any stress relieving treatment on this trackwork for the reason that the temperatures which would be required for stress relieving are high enough to destroy the heat treatment of the manganese steel parts and make them exceedingly brittle. The fact that these welds cannot be stress relieved after they are made is one of the reasons why it was difficult to obtain a strong weld between manganese steel and rail steel, until a special welding technique was introduced, using a combination of manganese steel rod and another type of rod. This technique, developed by Taylor-Wharton, has contributed largely to the success of these assemblies. They are known as "Spanweld" trackwork.









METHODS AND MATERIALS

Will Use Aluminum for Harbor Vessel Pilot House

Use of aluminum structural shapes and plates above the deck line in the pilot house of a small pusher-type harbor vessel is being specified by army engineers in Pittsburgh. Aluminum has been chosen for such a narrow-beamed vessel, as the one contemplated, to prevent the vessel from becoming top heavy. According to the specifications, the vessel will be 44 feet long, 10 feet wide and 5½ feet deep; bids for its construction will be taken Feb. 8. About 28,000 pounds of steel and 1000 pounds of aluminum will be required for the boat. Wrought iron rivets are specified for the vessel's hull.

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Chromium Ladle Additions Are Made More Easily

A recent development of interest is the production of a special ferrochrome to facilitate ladle additions of chromium. Ladle additions are made advantageously when the percentage of chromium to be added does not greatly exceed 1.0 per cent. Many foundries find it economical and convenient to melt down a cast iron suitable for a majority of their castings and then to modify it in the ladle by alloy additions when castings having special properties are desired. This special ferrochrome is dissolved more readily than the standard grade by the molten metal in the ladle and is particularly suited for making such additions of chromium.

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Grinding Shaft Pinions For Type Setters

Driving shaft pinions for line type composing machines are ground by a maker of these machines on a cylindrical grinder equipped with a 60-grit, grade L, aluminum oxide wheel, 10 x 2 x 5 inches. The wheel is operated at 1700 revolutions per minute and the work at 300 revolutions, with the traverse speed at 6 feet per minute, with no change in the speeds for finishing. About 0.012-inch of stock is removed.

s s s

Hard Faced Valves Show Greatly Increased Life

Hard facing of gate and globe valves with stellite for high-pressure, high-temperature steam service is meeting with increased favor. Valve trim of the cobalt-chromium-tungsten alloy is not only nongalling and resistant to wire drawing, but is also resistant to corrosion and erosion and, because of its red hardness, is particularly suited for this type of service. Gate and globe valve seats and disks faced with the alloy are said to outlast the usual seating materials six to ten times.

One plant reports that hard faced valves have been in service for two years without leaking, as compared to a life of only a few months for valves made of other materials. In this particular plant's experience, hard faced valves have never been cut by steam. At another plant, a hard faced seat ring and disk showed

Deck Well Ventilated

BRIDGE FLOOR OF OPEN STEEL MESH: Installed recently on the Summit street bridge, Lockport, N. Y., this nonskid decking comprises alternate straight or carrying bars, 2½ by 3/16-inch, spaced on 2½-inch centers, and bracing bars, 1½ by 3/16-inch, placed on edge and fastened together with ⅜-inch cold driven rivets at intervals of 5 inches along the straight bar. A product of the Irving Iron Works, New York, the material is delivered to the job in units, 12½ feet by 2 feet, fabricated to permit side and end splicing by riveting. The decking is fastened to channels on the bridge stringers, by means of clip bars on the decking welded to the supports every 10 inches for the width of the bridge. First described in STEEL *for May 22, 1933, p. 26, the flooring weighs only 22 pounds per square foot, requires no camber or crown, is self-cleaning and self-draining. No maintenance is required beyond occasional spray painting*

no indication of scoring or wire drawing after 14 months service on a 460-pound superheater line and the valve was as tight as when installed. This performance record is all the more significant when it is considered that the valve was used for drip service, a type of service most severe in its action on the valve seats and disks.

Still another plant which operates its boilers at 1200 pounds per square inch reports that the life of the valves on its boiler feed pumps has been increased from 500 hours to more than 5000 hours by hard facing. Such reports as these seem to justify the valve manufacturers' confidence in hard facing as a means of prolonging valve life.

S S S

Red Lead and Hair Felt Make Insulating Filler

In building steel structures having two layers of sheets or plates with an insulating space between them, hair felt frequently is used as a filler. The surfaces on both sides of the insulating space first are covered with a coating of red lead paint of good quality. After the paint partially has set, the hair felt is pressed evenly on the painted surfaces and allowed to dry for several days. The felt sticks so tenaciously that it is pulled apart before any of it can be pulled away from the surface. This treatment gives soundproofing and insulating values and also gives a good protection to the closed-in steel surfaces.

S S S

Preheat High-Carbon Steel For Torch Cutting

To give best results for torch cutting, high carbon steel should be preheated to between 800 and 1000 degrees Fahr. Much depends upon the shape of the piece, however. High temperature should not cause cracking; in fact, it should be favorable to prevention of cracking, provided care is taken to insulate the piece well and cool it down slowly. On the other hand, high temperature is unfavorable to smooth cutting and should be avoided.

Toggle Clamp Reduces Set-up Time On Sheet Metal Assembly Work

BY FRANK McKENNA, Production Manager,
Detroit Stamping Co., Detroit

ONE of the major problems confronting sheet metal production engineers is the elimination of stray costs arising from incalculable forces, such as buckling of parts and difficulty of handling. Numerous devices have been tried out for holding down work to insure alignment or to permit of the working out of succeeding operations as occur in the assembly of automobile bodies, refrigerators and kindred assembled articles.

Some Popular Methods

Perhaps the simplest way of aligning two members is to use pilot pins, locating either by holes in the part, or by nesting at corners. When working with sheet metal, however, it is necessary to use something additional to hold the stampings or sheets against the form to prevent excessive buckling while welding or to avoid slipping of parts when riveting. The standard "Cee" clamp is used frequently in this capacity and is invaluable for short run jobs. Present day mass production set-up requires a clamping device which locates each and every time in the same spot with uniform pressure, and provides ease and speed of handling.

Another work holding device is the cam action clamp which has its uses. This style of clamp is simple to make and install, having the main advantage of price, but a disadvantage in that it is apt to fly open on the fixture if a sudden jar or impact occurs.

Well known to the designers and toolmakers is a quick action clamping device known by various names—"grasshopper", "rapid action" or "toggle clamp". Naturally the mechanical principle has been known for years, but common usage seems to have started around 1920 when metal fabricated bodies for automobiles became a production factor in the large automotive plants.

The cardinal principle of this toggle clamp is that the handle and the clamping bar travel on two distinct orbits, the orbit of the handle being twice the diameter of the clamping bar orbit. The location of the pivot points of these two orbits in relation to each other is also a factor in design. The speed of the bar and the travel of the handle being in direct relation to all these points. The bearings must be without excessive play because, due to the leverage principles of construction, looseness is amplified considerably at the pressure end of the bar. By comparative tests made over a long period it has been found that hard bronze bushings stand up better under compressive and shearing stresses induced by the action of bar when exerting pressure, rather than having a soft steel, straight pin. The bushing acts also as a spacer and is stationary, the members rotating around it.

Adjusting for Springback

One point often causing considerable trouble in the shop when fitting the assembled clamp to the fixture or device is the adjustments required to be made after all parts are screwed and dowled, due to the springback of the part or possibly an error in laying out the job. A simple remedy is to have a stud bolt with a nut on each side of a separate bracket, the bracket to be held in place on the toggle bar by friction until all parts are lined up, at which time it is welded to the toggle bar.

The toggle clamp shown in the ac-

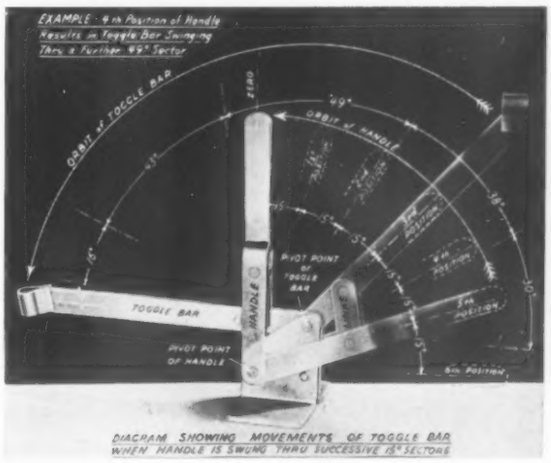


DIAGRAM SHOWING MOVEMENTS OF TOGGLE BAR WHEN HANDLE IS SWUNG THRU SUCCESSIVE 18° SECTORS

◆

QUICK-ACTION clamping device for sheet metal production work. Orbit of the handle is twice the diameter of the clamping bar orbit

◆

companying illustration combines the cumulative experience of tool shops extending over a period of years. As will be seen, movement of the handle through 80 degrees results in the bar moving through a 160-degree arc.

On first glance it would appear the mechanical advantage is in favor of the toggle bar in consequence of its longer motion. This, however, is not so as a glance at the diagram will show; 70 per cent of the travel of the handle is comparatively without effort because it is merely traveling to the work. The bar for this period travels approximately three times as fast as the handle. From this point on, the handle travels increasingly faster than the bar, at the final 5 degrees of travel having a mechanical advantage of 12 to 1.

This design with the links on the outside and the location of pivot points as on the clamp shown here, gives all the advantage of equal or greater pressure at the toggle bar plus the important advantage of the full clearance of the hold-down point from the work, when open, with only a short movement of the handle.

The clamp gives high compressive and tensile values, yet has the advantage of being light in weight and durable.

Two Kinds of Price Cutting Cause Loss And Demoralization in Industry

THERE are two forms of price cutting, both pernicious, and both detrimental as a method of promoting sales, said F. W. Christensen, Cincinnati Gear Co., Cincinnati, in addressing the recent semiannual meeting of the American Gear Manufacturers association, at Milwaukee.

The first is that practice of quoting prices which are below cost. This usually results from ignorance of the cost of the product and obviously, if continued, sooner or later would lead to bankruptcy. The right price for a product is an extensive subject in itself, of course; but not understanding that right price is probably the greatest cause of price cutting.

Besides the very real injury to the firm indulging in such a practice, there is a definite effect on business in general. With low prices, the worker and the employer receive less, and consequently buy less, and sales are fewer. It is a natural reaction and one the world has always known too well. There must be a true knowledge of the cost of a product plus a fair profit for real prosperity.

Would Level Out Prices

This knowledge of the true cost and the resulting right pricing of a product would correct prices that are too high as well as those that are too low. If *A* quotes a price which is too high, he loses the order to *B*, who has submitted the lowest price. Naturally, *B* cannot continue to lose a profit so he raises his price the next time, while *A*, hoping to get the order, lowers his. How much better it is to understand the correct cost and the right price for a fair profit at the start.

Prices may differ in certain localities, due to labor, overhead, and the policy of the company, but there should be no great difference. I once had a purchasing agent tell me that in response to inquiries for gears the prices differed as much as 300 per cent. There should be no excuse for such price variation.

So if we know our costs and quote a fair price, our own sales and business in general will improve.

The other form of price cutting to promote sales is that detestable practice of re-quoting after hearing a competitor's quotation. Needless to say, the psychology of this practice is fundamentally wrong.

If a competitor's price is fair, cutting that price continually means a steady loss of profit. If this loss cannot be recovered on other orders, the company could not remain in business. Orders yielding a large profit are hard to get the first time, and almost impossible the second time; whereas, a firm that has been favored by a remarkably low price one time, expects it ever after, and will not pay a greatly increased price.

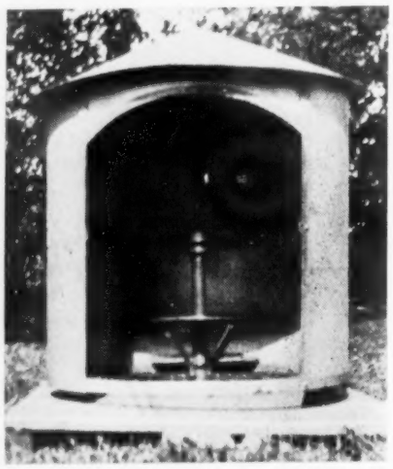
A company can make many such sales, as many as they can handle, but it is not good business. When a company gets a reputation of cutting prices in order to make the sale, that reputation is hard to live down.

Buyers Will Not Be Fooled

A buyer soon learns of the manufacturer's price weakness and will use this knowledge to his own advantage and to the disadvantage of the seller. A buyer has no respect for a price cutter.

Then, too, the buyer instinctively feels that either the quality of the material is poor or that the workmanship is not good. He knows that there is no truer axiom in the world than "You cannot get something for nothing." He may be able to get a good bargain once in a while, but he is smart enough to know that he will usually get just what he pays for. Therefore, a firm that continues to promote sales at prices which are either too low or too high, loses its reputation, the friendship of its competitors, and that all important reason for being in business, a fair profit.

"Let It Rain"



REVOLVING METAL SHELTER HOUSE: Built of steel angles covered with sheets, painted or galvanized, this shelter house pivots on a central axis, so that the door may be pushed to the side opposite the wind. It was designed by T. C. Patterson, Lebanon, O., who lives next to a golf course and developed his idea after seeing golfers seeking shelter from a rain squall. The house is built to accommodate 12 or 16 people, has a rack for golf bags, a mirror and two large windows. Photo courtesy American Rolling Mill Co., Middletown, O.

New Type Motor Operates From A-C Power Source

A revolutionary new type of electric motor, which utilizes a "stationary commutator" and has the characteristics of a series-type direct-current machine but which operates from an alternating-current power source, has been developed by E. F. W. Alexanderson, consulting engineer, General Electric Co., Schenectady, N. Y. Known as a "thyratron" motor, the new development is made possible by recent advances in the application of electron tubes.

The thyratron tubes perform two distinct functions, one being commutation and the other being grid-controlled rectification. Each of these functions has significance in the performance of the new motor. Through the commutator function, the smooth variable speed-torque characteristics of a direct-current motor are obtainable, without any reference to synchronism with the power source used. The grid-controlled rectifier function

provides the motor with continuous power control from standstill to maximum speed, without wasting power in resistance.

Motors of this type are applicable to such auxiliaries as fans, centrifugal pumps, compressors, and similar equipment having load characteristics such that the series type of motor can be used to advantage.

New Molybdenum-Tungsten High Speed Steels Now Available Commercially

CONSIDERABLE interest is being shown at present in a new class of molybdenum-tungsten high speed steels, which, although discovered more than two years ago, has only recently been available commercially. These steels, placed on the market under the general trade name of Mo-Max, are said to compare favorably with the long established 18-4-1 class of high speed steels containing 18.00 per cent tungsten, 4.00 per cent chromium and 1.00 per cent vanadium.

In this new class of steels, the principal alloying elements are molybdenum, tungsten, chromium and vanadium. Molybdenum is the chief alloying element, the beneficial effect of the molybdenum being augmented by the addition of a lesser amount of tungsten. Approximate composition of the grade now being commercialized is 8.00 per cent molybdenum, 2.00 per cent tungsten, 4.00 per cent chromium, and 1.00 per cent vanadium. Carbon content runs about 0.10 per cent higher than in comparable grades of the 18-4-1 steels.

First Publicized in 1932

Discovery of this molybdenum-tungsten high speed steel was made by Joseph V. Emmons, metallurgist, Cleveland Twist Drill Co., Cleveland, and was first reported by him in a paper presented before the 1932 convention of the American Society for Steel Treating (now the American Society for Metals). The paper was published in the March, 1933, issue of the society's *Transactions*, and subsequently was judged the best published during that year, a distinction for which Mr. Emmons was awarded the society's Henry Marion Howe gold medal.

Since 1932 further research work has been conducted with the molybdenum-tungsten class of steels and has resulted in commercialization of the composition already mentioned. The following companies are now making and selling Mo-Max under their individual tradenames: Crucible Steel Co. of America, New York; Ludlum Steel Co., Watervliet, N. Y.; Universal Steel Co., Bridgeville, Pa.; Cyclops Steel Co. Inc., Titusville, Pa.; Latrobe Electric Steel Co., Latrobe, Pa.; and Braeburn Alloy Steel Corp., Braeburn, Pa.

The technique of working these steel is similar to that which has been developed for the 18-4-1 class of tungsten steels. Forging and rolling is done at slightly lower temperatures than with 18-4-1, but it forges somewhat more easily. Annealing is done in exactly the same manner, using the same temperatures and periods of heating. The resulting hardness is slightly less, which is cited as the probable reason that the molybdenum-tungsten type is more easily machined than the 18-4-1 type.

Lower Hardening Temperatures

Hardening is done in a similar manner to 18-4-1 except that the hardening temperatures are about 150 degrees Fahr. lower. Hardening temperatures are varied according to the carbon content of the steel and the type of tool being made, just as is done with 18-4-1. Tempering is performed in the same way and at the same temperatures. The hardness of the hardened and tempered steel usually is slightly higher than that of 18-4-1, this being due, it is believed, to more carbon dissolved in the steel.

Tools made of the new molybdenum-tungsten high speed steel normally exhibit greater hardness than those made of 18-4-1, but at the same time have toughness equal or better. On regular production work, it has been observed that tools made of the new steel are scarcely distinguishable on performance from those made of 18-4-1. It was also observed that in some cases in which the new steel showed definite advantages, the type of work was difficult jobs with which trouble had been experienced with 18-4-1 high speed tools.

It can be pointed out that the specific gravity of the molybdenum-tungsten steel is about 9.0 per cent less than that of 18-4-1, which means that a lesser weight of steel is required to make a tool of a given size. The grinding sparks have a distinctive appearance which makes it possible to distinguish the new high speed steels from 18-4-1 or other types of steel.

Development of the molybdenum-tungsten high speed steels is of special significance from the general economic standpoint. The generally used type of high speed steel, namely 18-4-1, contains about 18.00 per cent tungsten, an element for which the United States has been dependent upon foreign sources for approximately 75 per cent of its requirements. This imported tungsten has been obtained largely from China, although the production of Burma, the Malay States and other countries, has been appreciable. However, the bulk of production having come from China, the price has been controlled principally by the amount of Chinese tungsten available.

Held Strategic Material

During the past 20 years tungsten prices have fluctuated over such a wide range that a feeling of instability has existed and industry has been forced to carry large and expensive stocks of tungsten for protection. The war department considers tungsten as a "strategic material," that is, an essential material from which the country might be cut off in time of war. A large part of the tungsten consumed in this country, perhaps as high as 75 per cent, goes into the manufacture of high speed steel.

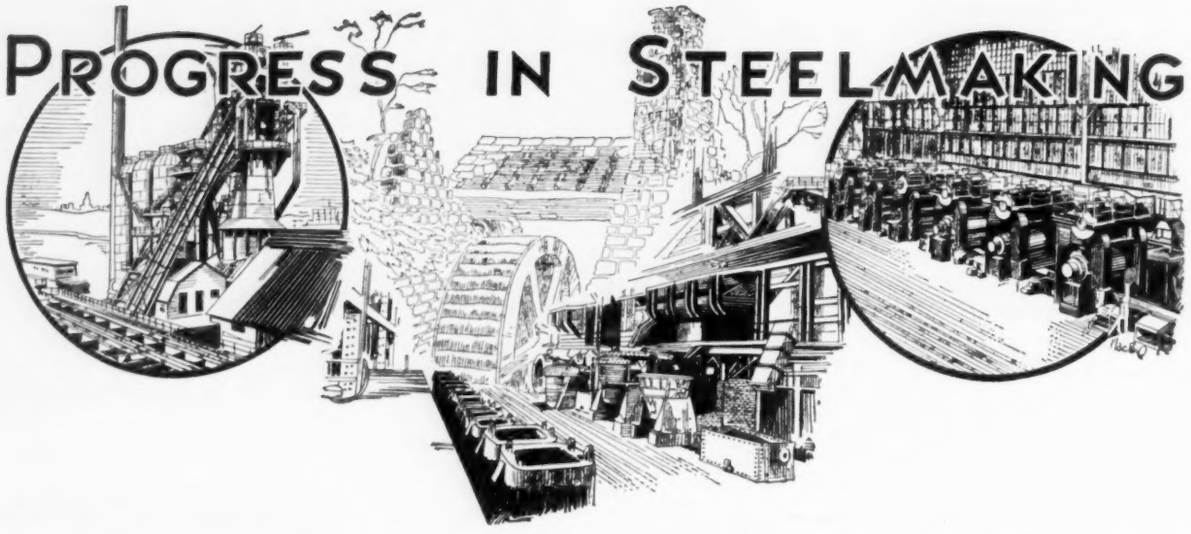
While the United States never has been able to supply more than about 25 per cent of its tungsten requirements, even under the stimulus of high prices during the World war when high speed steel reached the extremely high price of $3.00 per pound, still the country has a valuable although small tungsten mining industry. It is estimated that the domestic tungsten mining industry is capable of producing enough tungsten to meet all requirements if all of the high speed steel in use were of the molydenum-tungsten type, requiring approximately 2.00 per cent tungsten.

Of the world production of molybdenum, about 85 per cent is supplied by the United States. Molybdenum ore reserves sufficient to last for many years are definitely known; thus an ample supply of this element is available to meet all probable requirements. The molybdenum-tungsten class of high speed steels contains about 8.00 per cent molybdenum, which indicates a potentially large consumption of molybdenum for this class of steels alone.

Installs Large Press Brake

An unusually large, heavy duty, press brake has been installed by the By-Products Steel Corp., Coatesville, Pa. It is 12 feet 6 inches between the housings and has an 18-foot bed. On it, right angle bends can be made 1 inch thick and 12 feet long, or ¾-inch thick and 18 feet long.

PROGRESS IN STEELMAKING



Introduces New Commodity

Square steel wire of special composition now is being fabricated into screws that drive like nails but turn and hold like screws. They are pointed like nails, have shanks and are hardened throughout. The screws are being used for fastening steel to steel, wood to steel, steel to concrete, for fabricating automobile bodies, and for fastening metal sides to brick or concrete walls thus dispensing with expansion bolts.

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Minimizes Cost of Upkeep

Reduction of maintenance work on steelworks cranes has been effected at an Ohio plant by building up the crane rail ends with an oxyacetylene torch. The ends of the rail wear down and give the crane a perceptible jolt at each joint. Application of a filler rod, which will give a texture resembling that of the rail itself, has given satisfactory service. The same operation is applied to switch points and frogs in the steel mill yard railroad system.

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Cost of Power Is Reduced

Power required to operate a hot strip coiler was reduced 25 per cent by the installation of a centralized system of lubrication. After two years of continuous service the bearings were reported in good condition.

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Aids Stamping Operations

Sheet steel with a grain size of ⅛-inch diameter at a magnification of 100 diameters has been found by a large fabricator to be best suited for general purposes. This is equivalent to 81.4 grains per square inch at a magnification of 100 diameters. Such a grain size appears to be satisfactory from the standpoint of toughness and of removing stretcher strains and buckles. The steel does not pull coarse on deep draws except on such stampings as automobile fenders where a slightly smaller grain size is indicated.

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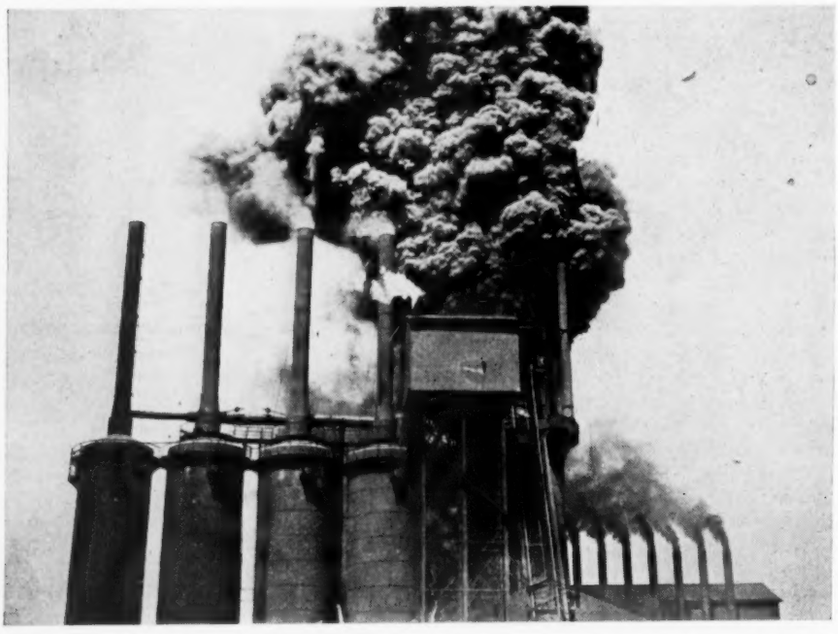
Favors Small Melting Unit

Backers of the small electric-type melting furnace have found considerable future prospect for their product from several cheap power programs proceeding under national sponsorship throughout the country which would place the small open-hearth installation at a distinct disadvantage. Recently a leading maker of electric furnaces stated that in its forecast it ex-

Blast Furnace in the Act of Slipping



RUMBLINGS AT THE TOP: Remember the days when the blast furnace turned rebellious and, in rage, opened its mouth and rained red ore and hot coke on the cast house roof and over the furnace yard like giant hailstones? And then continued to spit out into the air clouds of ore dust which floated over the fields and hillsides and reddened them for miles around? The accompanying snapshot shows a blast furnace as it started on the rampage. Blast furnace "slips," as they are called in works parlance, under present-day practice are almost a rarity; but two decades ago they were most frequent. Clouds of dust such as shown herewith led certain property owners in Pittsburgh to bring suit against a blast furnace operator for marring the external appearance of their stone houses which were located a few blocks from the furnace yard. These same stacks later were equipped with explosion doors at the top of the bleeder pipe which opened inward instead of outward as was customary

pected the small steelmaker soon would turn to electric furnaces and cited the case of a recent installation where the furnace with a capacity of 3 tons per hour, would be used for making steel billets.

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Sized Fuel Is Recommended

When screened coke larger than 1 inch is to be used in the blast furnace, maximum results can be obtained by charging the sized fuel in layers in certain predetermined quantities rather than by charging the run-of-oven unsized fuel.

• • •

Production Is Augmented

Adoption of immersion heating of salt baths at the plant of a wire manufacturer has effected an increase in production of 60 per cent and decreased the gas consumption 50 per cent per ton of output compared with former practice.

• • •

Affords Deep Penetration

Refinements of carbon-controlled strip steel by a Pennsylvania producer of cold rolled stock has resulted in a product that takes a deeper penetration in carburizing at a standard time cycle than steel of ordinary quality, according to recent tests. Exfoliation caused by grinding cracks is effectively corrected. Impact value of the heat treated steel averages more than 5:1 higher than the impact of plain carbon steels.

• • •

Employs Rubber Tire Drive

A motor-driven trolley suitable for pickling and other departments in steel plants and which features the use of an air-filled or live rubber wheel to drive the bottom of the monorail section, has been designed. The high co-efficient of friction between the wheel and the rail gives a nonslipping grip against the steel rail section, resulting in a powerful drive unit.

• • •

Bearing Life Is Extended

Parts of tinning machines are being hard faced with economy. The bearing end of the driving gear on the top roll of the tinning unit is subjected to severe pressure and suffers from lack of lubrication because of heat and from attack of acid from the flux, necessitating its removal about every six days to have the bearing turned down and a new journal box fitted. Applying hard facing material to this bearing makes it last for the life of the roll.

Introduces Crane To Handle Complete Mill in One Lift

MODERNIZATION of steelworks and rolling mills and the building of new steelmaking and finishing mill equipment within the past few years have included larger capacity units. To operate these units successfully required facilities for handling heavier loads and with greater flexibility. Many unusual machines for serving various steel plant departments have been developed including various type cranes.

Of recent introduction is a combination 150-ton stripper and extractor, photographic details of the tongs of which are shown in Fig. 2. The trolley of this machine is mounted on a bridge with a 70-foot span and is so designed that it can strip ingots from either the conventional type of ingot mold (big-end-down), or the inverted type of mold regardless of whether the ingots in either case are equipped with hot tops or not. One of the salient features of this machine is the ease with which it can be adapted to handle any type of ingot.

The axes of the tongs that engage the ingots, as will be noticed from the illustration, are parallel with the axes of the tongs that engage the mold. This patented feature greatly increases the operator's vision. With the axes of the two sets of tongs parallel, excessive hoisting and lowering is eliminated for it is only necessary for the operator after engaging the hot tops of the ingots to apply the stripping force, thus relieving the ingot from the mold. He then releases the grip on the ingot and proceeds to the next mold without having to raise the stripping head to secure tong clearance. This feature greatly facilitates the stripping cycle.

In this machine the stripping force is accomplished by means of a double-acting screw driven by a suitable train of gearing. The latter is fully enclosed and runs in a bath of oil. The screw and nuts are fully enclosed, protected from dirt, and are bathed constantly in a stream of lubricant. The crane was built by the Alliance Machine Co., Alliance, O.

Handles Standard Molds

Another unusual type of crane designed by this company for stripping ingots may be classed as a single purpose tool in that it handles only the standard or big-end down type of ingot. Until the advent of this machine the slowest part of the stripping cycle was the lifting of the mold from the ingot after stripping had been accomplished. This machine is a 2-speed mechanism in that it exerts the slow powerful stripping force only so long as that force is necessary. Immediately after the ingot is free from the mold it automatically increases its hoisting speed. This design speeds up the stripping cycle.

A different type machine is the

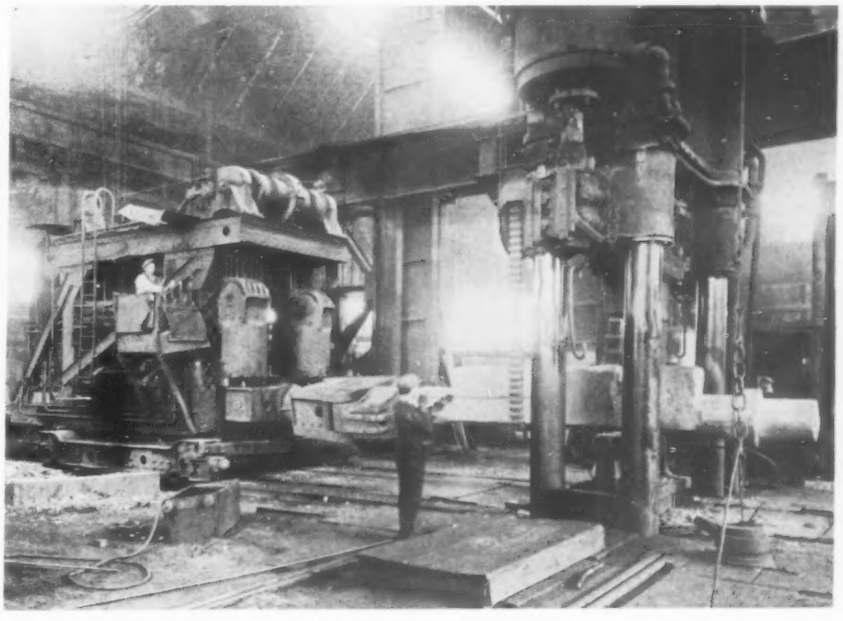


Fig. 1—Forging manipulator which affords a larger amount of work to be accomplished in the same heat

275-ton, 4-girder ladle crane shown in Fig. 3. This crane, one of three identical units on the same runway, has a span of 54 feet. The main trolley has a capacity of 275 tons, the auxiliary trolley has a main hoist of 40 tons and an auxiliary hoist if 15 tons capacity. The main hoist and trolley travel of the main trolley, and the main hoist, auxiliary hoist, and trolley travel of the auxiliary trolley all are worm driven. The main hoist is equipped with a patented safety reeving, shown in the illustration. The bridge is equipped with two internal hydraulic brakes. These cranes are said to be the largest hot metal cranes in the world.

Has Separate Runways

A crane of 300 tons capacity and with a span of 100 feet is shown in Fig. 4. It is designed along the lines of a ladle crane in that the bridge consists of four girders, the main trolley running on the two main girders and the auxiliary trolley on the secondary girders.

The main trolley is of 300 tons capacity. The auxiliary trolley has a 40-ton main hoist and a 5-ton auxiliary. Because of the large capacity and long span the girders of this crane are fabricated from silicon steel. The unit was installed for the purpose of handling a complete mill at one lift.

An entirely different type of machine, but as spectacular in its operation as any previously described, is the 20-ton Alliance forging manipulator shown in Fig. 1. The manipulator is shown handling a 4-throw diesel engine crank shaft under a 2000-ton steam hydraulic press. The manipulator operates in conjunction with a standard forging crane and rotating block.

Inasmuch as the manipulator positively can rotate and accurately spot the forging on the dies, a much larger amount of work can be accomplished in the same heat. This not only facilitates forging production but also contributes to the quality of the forgings produced. This is said to be the largest forging manipulator ever built and is installed at the plant of the Erie Forge Co., Erie, Pa.

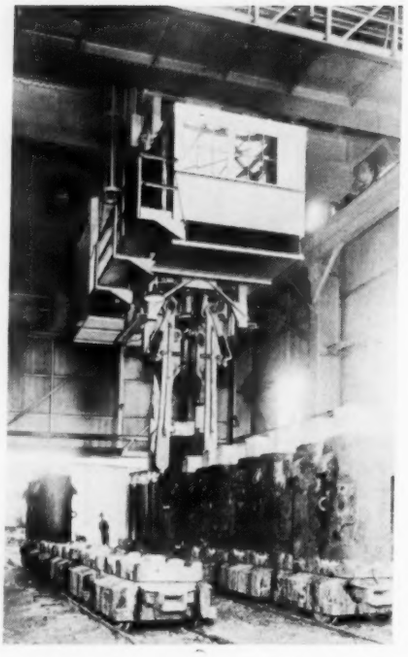


Fig. 2—Ingot stripper and extractor crane adapted to handle any type ingot

A.S.T.M. Issues 1935 Index Listing Its Standards

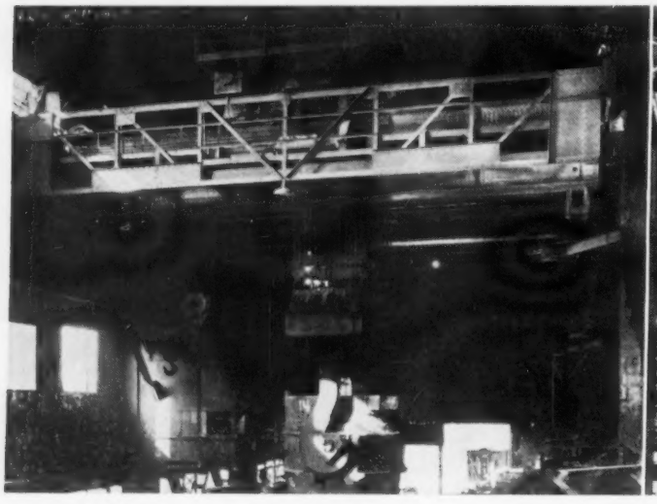
American Society for Testing Materials has just issued its Index to A. S. T. M. Standards and Tentative Standards, as of Jan. 1, 1935. This index is designed to be of service in determining whether the society has issued specifications or test methods on particular materials or subjects in the materials field. Since the total number of A. S. T. M. standards and tentative standards is some 730, the index is a decided convenience in this respect and also helpful to those interested in the materials field, such as purchasing agents, engineers, and others, in locating any of the items in the publications in which they appear.

All specifications and tests are listed under appropriate key words and the items under a particular subject as arranged alphabetically according to the significant word in the title, thus facilitating use of the index. A list of numeric sequence of the serial designations also is included.

Copies of this publication, aggregating 142 pages, may be obtained without charge by addressing A. S. T. M. headquarters, 260 South Broad street, Philadelphia.

Study Effect of Notches on Fatigue of Metals

"Influence of Chemically and Mechanically Formed Notches On Fatigue of Metals" is the title of a report by Dunlap J. McAdam Jr., national bureau of standards, and Robert W. Clyne, mechanical engineer, American Steel Foundries, Chicago, and published as research paper RP725 of the bureau. Copies of this paper are obtainable at 5 cents each from the superintendent of documents, government printing office, Washington. The report contains 45 pages of results of tests and contains numerous curves and charts illustrating the results obtained.



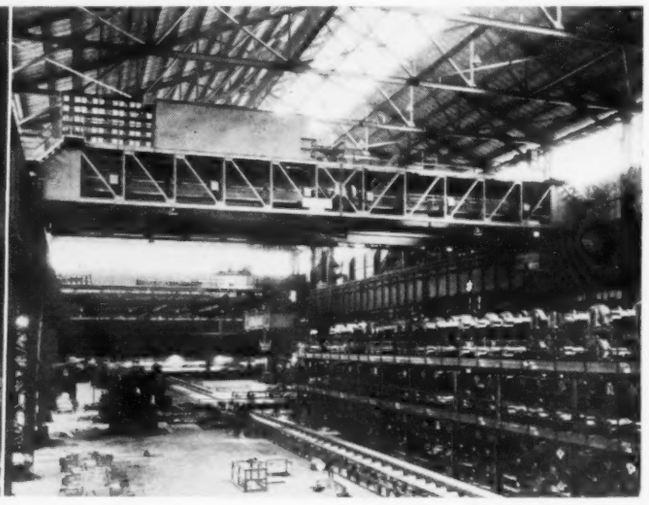


Fig. 3 (Left)—One of the largest cranes built for handling hot metal. The main trolley has a capacity of 275 tons. Fig. 4 (Right)—Four-girder 300-ton crane which handles a complete stand of rolls at one lift

Coke Plant Still Waste Is Clarified by New Process

BY B. K. PRICE
Associate Editor, STEEL

AS A SOLUTION to one of the most perplexing problems in the operation of a by-product coke oven plant, a process for the clarification of coke plant still waste, or weak liquor, has been announced by the Lancaster Iron Works, Inc., Lancaster, Pa. By this process, a variety of contaminants, including phenol, are so disposed of as to preclude the pollution of air and waterways with its costly and devastating consequences.

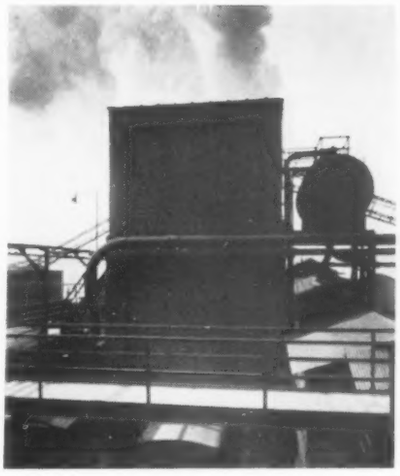
As a matter of fact, this process is aimed directly at the pollution of waterways, for the company for the past two years or so has been successfully marketing a process for dry quenching which has eliminated the necessity for disposing of destructive vapors through the air. However, where the practice of wet quenching still is being conducted, the waste clarification process serves as a direct preventative and further, operating in conjunction with dry quenching equipment, offers additional advantages in the way of production economies.

Under the ordinary method of wet quenching still waste is disposed of by its inclusion in the water poured over the coke which results in clouds of destructive vapor. This vapor not only pollutes the air around the plant but devastates the surrounding country.

Process Operates Mechanically

The clarification process is mechanical in operation instead of chemical, from which latter tack there have been so many unsuccessful efforts in coping with the problem in the past. In this process the raw still waste is delivered to a dephenolization unit where it is mixed with a coagulant (paper pulp or similar material) to assist in collecting the free solids and tarry compounds. This mixture then is fed into a vacuum-type rotary filter where the coagulant and free solids are collected and discharged for burning with other fuels.

The effluent from this filter is drawn off, pumped into a still waste storage plant, then combined in a mixing chamber with the proper quantity of "Nuchar" (activated carbon) where it is agitated for the predetermined time needed to collect the phenol, and then fed into a second vacuum-type filter. The



Quenching tower at a by-product coke plant. The new process aims to eliminate the clouds of steam and vapor which result from the quenching operation

spent "Nuchar" is discharged from this filter in cake formation and fed directly into a drier. From here it passes to a revivification furnace to be reconditioned with the necessary make-up of unused "Nuchar" and pumped back to be used over again.

The effluent from this filter is clear water white, odorless and phenol free, although still retaining the soluble solids of the still waste. This clean water effluent then is pumped into an evaporation unit where the water is distilled off and the soluble solids discharged as a 40 per cent concentrate to a field reservoir, from which if desirable this material can be recovered at any future time. No still waste whatsoever goes into streams or rivers.

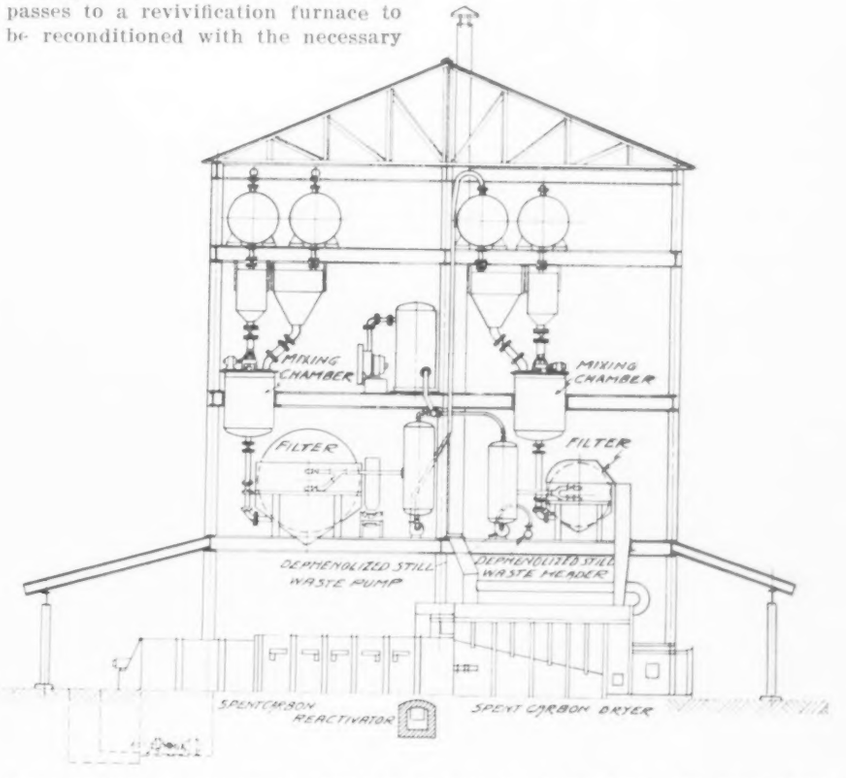
Adjunct to Dry Quenching

The evaporation unit is built as a part of the dry quenching operation so as to make use of the exhaust steam from the cooling circulating fan turbines and to deliver the distilled water for use in the dry quenching plant boilers.

The successful elimination of phenols from the still waste, it is said, has been possible through the selective affinity of "Nuchar," which attracts only phenol and allied color forming materials.

The removal of free solids and phenols from still waste takes place at atmospheric temperature, which, it is pointed out, eliminates the destructiveness of the still waste so that evaporators built of merchant steel can be used; no special metals or alloys are required.

The operation of the clarification unit is said to be practically automatic and continuous as the only



Cross section of still waste clarification unit for by-product coke oven plants

manual operation necessary is the replenishment of the stock of pulp and "Nuchar."

In discussing the dry quenching and still waste clarification units, company officials declare that the former, based on a 12-month report from one plant, has a steam output of 1137.12 pounds from and at 212 degrees Fahr. per ton of coke cooled, while the steam actually is being produced at an average pressure of 225 pounds with 118 degrees superheat.

The still waste clarification installation, it is said, will show a delivery of more than 550 pounds of distilled water, including steam used in evaporation, per ton of coke produced, with the steam included being about 120 pounds. The still waste process charge against the coke plant is said to amount to only a few cents per ton of coal charged.

A.S.T.M. To Test Galvanized Wire and Wire Products

FOR some time the American Society for Testing Materials has been developing plans for a systematic study of outdoor atmospheric corrosion of galvanized wire and wire products. Farm fencing, barbed wire, chain link fencing, telephone and telegraph line wire, tie wires and strand cable are typical of wire products included in these proposed tests.

The tests will be carried out by committee A-5 on corrosion of iron and steel under the direction of a special wire test committee carefully selected to bring to the work a thorough knowledge of the manufacture, sale and the proper use of these fence products. The wire test committee comprises recognized authorities on fence economics enlisted from national agricultural societies and state experiment stations, technical experts from the steel manufacturers, galvanizers and zinc producers, representatives from the commercial departments of fence manufacturers, and technical representatives from industrial consumers of wire and wire products.

Because of the widely different uses to which these products are put, the present discussion is confined almost entirely to the portion of the program dealing with farm fencing and barbed wire. This work has two major objectives: (1) To obtain useful engineering information concerning materials generally used for fencing or which offer promise of economic suitability for use in fencing in the near future; and (2) to assist in setting up national standard specifications for fencing and barbed wire which will afford consumers an adequate guide in purchasing these materials. Under (1) above, it is planned to study those factors of major importance in determining the economic suitability of various types of fencing for particular areas.

Briefly, the general test program is as follows: Samples of typical fence fabrics and the wires from which they are made are to be supplied by representative manufacturers co-operating in these tests. With these samples, each supplier will submit their early history, chemical composition and physical constants of the base metals and coatings, photomicrographs showing the metallic structure of the product and the nature of the bond between the base metal and its coating. Before being accepted for test, all selected materials will be carefully checked at a central testing laboratory to insure that their chemical and physical properties are as intended by the supplier.

Commercial Identity Removed

When all samples have been concentrated at a central testing laboratory, their commercial identity will be completely removed by a disinterested director of tests. When next these materials become available to the wire test committee for actual erection at the test sites, they will bear only serial number designations classified as to the type of base metal, wire size, type and weight of coating, etc. They will then be shipped to the several test sites and mounted on their proper racks.

Four types of fencing are to be tested as follows:

Type	Gage of top and bottom line wire	Gage of intermediate line and stay wires
1	9	9
2	9	11
3	10	12½
4	11	14½

Note: All samples are to be of standard hinged-joint type fence 39 inches high with 6-inch stay spacing.

On these types of fencing, various weights of zinc coating will be applied by a variety of coating processes. The weight of coating classes will range from 0.2 to 1.8 ounces per square foot of uncoated wire surface. Coatings still heavier than 1.8 ounce will be tested if such samples are available when the tests are begun. Four types of stainless steel fencing will also be tested and, if available, copper-coated and lead-coated fencing . Bare, or uncoated, wires will, in all cases, be exposed as control samples at each location.

Barbed wire samples will, in all cases, be made from 12½-gage line wire with 14-gage 4-point barb hog wire. Again a wide range of zinc coatings will be tested and in addition barbed wire carrying aluminum barbs.

The fabricated products, such as fence, will be erected in the usual way at the selected test sites and left undisturbed for observation as to general behavior, appearance, first signs of rusting, rate of spread of rusting, decrease in cross section of wire, etc. The unfabricated wire specimens are to be specially mount-

TABLE I

Test Location Selected for Various Materials

	Farm fence and barbed wire	Wire (unfabricated)	Strand (cable)	Chain link fencing
Pennsylvania State college, State College, Pa.	×	×	×	....
Purdue university, West Lafayette, Ind.	×	×	×	×
Texas A. & M. college, College Station, Tex.	×	×	×	....
Iowa State college, Ames, Iowa	×	×	×	....
Cornell university, Ithaca, N. Y.	×	×	×	×
Kansas State college, Manhattan, Kans.	×	×	×	....
*Pittsburgh, Pa.	....	×	×	×
*Sandy Hook, N. J.	....	×	×	×
*Bridgeport, Conn.	....	×	×	×

*Note: The starred locations are not rural, but represent industrial or sea coast locations where further information on the durability of chain link fencing and other fabricated wire products is desired.

ed in small racks to facilitate shipment to a central testing laboratory for physical examination at predetermined intervals. Here, their tensile strength and elongation will be followed as weathering proceeds and the nature of the corrosion attack noted. Since these tests destroy the samples, several samples of each type of wire will be exposed at each location, one rack being shipped in at each testing period, the other remaining for subsequent examination.

The wire test committee has endeavored, with the funds available for this work, to set up these outdoor weathering tests in widely scattered areas of the United States in which fences are used in large quantities. Table I outlines the areas chosen and the materials to be tested. Only those materials checked at each location will be tested at these sites.

Some conception of the magnitude of this investigation is obtained from the numerical summary of the samples shown in Table II.

TABLE II

Summary of Samples Included in Test Program

	Number of samples per location	Number of locations	Total number of samples per exposure period	Grand total
Plain wire	142	9	1,278	12,474
Farm field fencing	96	6	576	576
Barbed wire	27	6	162	162
Strand	13	9	117	117
Chain link fencing	6	5	30	30
Total				13,359

Data Will Aid Farmer

The farm field fencing and barbed wire samples are each one rod in length, and will require the erection of at least one fence post per sample per location. Since the fencing and strand are not brought in for inspection, only one set of samples per location is required. In the case of the bare wire samples a complete set is to be brought in and tested to destruction over a number of test periods which considerably swells the grand total of individual samples involved in the test.

It is recognized that certain factors which markedly affect the service life of fencing, such as mechanical damage and ruggedness of construction of the fence on the farm, will not be studied in the tests now planned. Such tests would require test facilities, resources and a testing personnel not now available to the A. S. T. M. Estimated conservatively, however, the test data available upon completion of the program will go far toward enabling the farmer or his technical advisors to make a proper comparison of the performance of fences which differ as regards base metal, wire gage, type and weight of coating, and to decide which type will meet his particular needs most economically and satisfactorily.

The wire test committee has recognized that fence fabric or wire products commercially available on the open market would not be a suitable source of supply from which to draw its test samples. The test program is focused entirely on the comparative evaluation of types of fencing—various base metals, different types of metallic protective coatings for steel wire, a wide range of weights of coating, various gages of wire. To evaluate each of these variables properly, it will be necessary that all line and stay wires of the same gage and weight of coating of each class of fence be made from the same bundle of wire; further, that every wire in a sample of fence, whether stay or line wire, carry the weight of coating designated in each class.

Furthermore, to obtain as much information of definite character as possible by these exposure tests, the committee feels it is important that these samples should represent a greater number of classifications as to weight of coating than would be obtainable from commercially available specimens; it is also important that these various types as to weight of coating should be controlled to as narrow a range as possible. It was, of course, well recognized by the committee that commercial brands of fence or other wire products could scarcely be fitted into this program and the wire and fence manufacturers have agreed to prepare specially these various specimens so that in the end the committee would have dependable information which could be used as a means toward the economic evaluation of all the various types of product that are available to the farmer now and that might later become available after this program has been completed.

Whole Industry Co-operates

In its work the committee has enjoyed the whole-hearted support of most of the nationally recognized fence manufacturers who have contributed not only to the funds necessary to finance the project, but the engineers' time, the supplying of samples and the laboratory work necessary to characterize them. The committee also has been assisted tremendously by technical experts from the agricultural colleges and societies who have contributed largely to the planning of the tests and have made available test sites for the long periods of time necessary to complete the investigation. As the tests progress to a point where accurate engineering information regarding the durability of fencing becomes available, such information will be released promptly through publications of the A. S. T. M., bulletins of the state extension bureaus and farm publications.

Proposes Standards for Wire Reels and Spools

New standards for manufacturers and users of reels and spools for insulated wire and cable have been proposed by a manufaturers' committee, a representative group of executives within the wire industry, for the purpose of correlating the design of producing machinery and wire handling equipment. A total of 32 spools and reels, which the committee believes are adequate for the processing and shipping of practically all classes of material, are included in the proposed standards. The simplification, it is assumed, is in the ratio of 1000 to 32. Reprints of the manufacturers' committee of reels and spools standards can be obtained for 25 cents a copy from *Wire & Wire Products*, 17 East Forty-second street, New York.

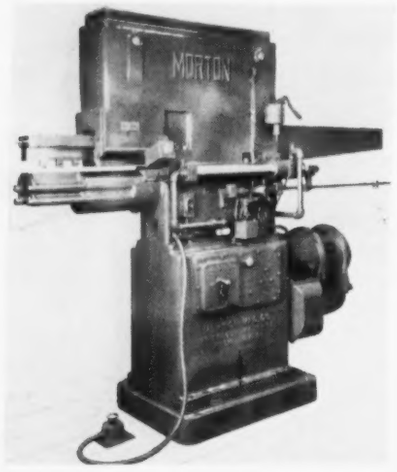
Thin Plated Coatings Fail To Prevent Corrosion

"Protective Value of Nickel and Chromium Plating on Steel" is the title of a 24-page report, printed as research paper No. RP712 of the national bureau of standards and written by William Blum, Paul W. C. Strausser and Abner Brenner. Mr. Strausser is the American Electroplaters'society's research associate at the bureau. Tests discussed in this report showed that the thickness of the nickel layer is more important than any other factor. An intermediate layer of copper decreases the protective value of thin deposits but is not detrimental in thick coatings, especially if they are chromium plated. The customary thin coatings, 0.00002-inch or 0.0005-millimeter, increase the resistance to tarnish but not the protection against corrosion. The paper is obtainable from the superintendent of documents, Washington, at 5 cents per copy.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Flash Trimming Machine—Morton Mfg. Co., Broadway at Hoyt, Muskegon Heights, Mich., is introducing a high-duty draw-cut flash trimming machine that is especially designed for removing the flash from butt welded steel rings such as automobile wheel rims. It is designed to take a width of seam up to 12 inches and stock thickness from 24 gage to 3/16 inch. Power is applied by an electric motor driving a hydraulic pump. The machine, shown herewith, has a variable and



Morton high-duty draw-cut flash trimming machine

return speed from 0 to 65 feet per minute.

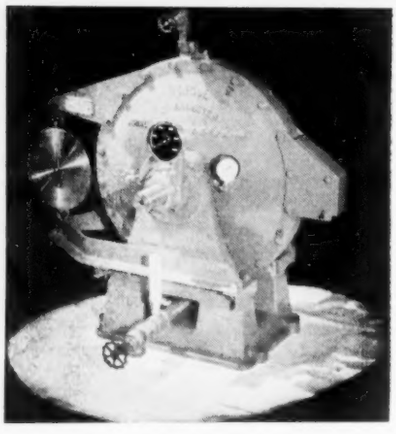
Power is applied to two reciprocating rams by means of hydraulically operated cylinders. Work is placed between hardened dies and sufficient pressure is applied through a hydraulically operated 'spring loaded toggle motion to securely clamp the work while trimming. A patented feature of vertically adjustable ram and dies is employed which automatically takes care of the clamping and positioning of the cutters in relation to the work. It automatically compensates for any variation in stock thickness.

The upper ram raises 2 inches, giving sufficient clearance for entering and removing the work. Cycle of operation is automatic. As the work is entered, the operator steps on the button, the machine automatically clamping starts its cut on the draw-cut stroke, releases the work at the end of the stroke, and the cutting tools return to the out-position. The distance from the clamping die to the floor is 55 inches. This may be varied to meet operation requirements. Patented adjustable tool holders and tool set-up are employed.

• • •

Dynamometer—Torque Products Co., 875 East Lake Forest avenue, Milwaukee, is introducing a "Torque" dynamometer, shown herewith, of the hydraulic absorption type, for the measurement of the torque and horsepower of gas, gasoline, oil or diesel engines or of electric motors, steam and hydraulic turbines, water wheels, speed reducers, brakes, tires, belts, couplings, clutches etc. It is also used for endurance or breakdown tests and for breaking in engines.

The dynamometer consists of an especially constructed stator within which one or more rotors of unique construction, rotate. Absorption medium is water, the power being dissipated in heat, under control. Both stator and rotor are mounted on annular ball bearings. Scale equipment, connected to the floating stator, measures the torque applied



"Torque" dynamometer of the hydraulic absorption type

to the rotor shaft, in either direction of rotation. Water consumption is nominal. The manufacturer states that there is a size and speed to meet any testing requirement.

• • •

Solenoid - Operated Switches—Allen-Bradley Co., 1311 South First street, Milwaukee, has developed type B enclosures of water-tight, weather-proof construction for its line of bulletin 709 solenoid-operated across-the-line switches having polyphase ratings up to 15 horsepower, 110 volts; 30 horsepower, 220 volts; and 50 horsepower, 440-550 volts; and for single-phase motors of the self-starting type. These type B bulletin 709 switches, shown herewith, are ideal for outdoor in-

Allen - Bradley solenoid - operated switch with water-tight enclosure

stallations and for use in pumping stations, or wherever the air is heavily charged with moisture.

The type B enclosure is of cast iron, cadmium plated to resist corrosion. A live rubber gasket between the cover and base keeps out all moisture. The top and bottom of the base are tapped for threading in conduit, thus making it possible to obtain a water-tight seal between the conduit and box.

• • •

Oil and Grease Seal—National Motor Bearing Co., Oakland, Calif., has developed a new oil and grease seal applicable to all types of machinery embodying shafts. The seal excludes extraneous matter and holds in oil and grease.

The seal consists of an outer steel case which locks the seal assembly permanently. An equalizing annular garter spring within the case provides a uniform continuous contact, pressing against the sealing member at all points on the circumference.

• • •

Moisture Indicator—Harry W. Dietert Co., 676 West Grand boulevard, Detroit, recently has introduced an instrument for determining the amount of moisture in a sand sample. The moisture teller will dry a 50 gram sand sample at 212 degrees Fahr. in 45 seconds. The sand sample is weighed before and after drying. The unit needs no calibration and is not affected by condition of the sand. The device consists of a cast aluminum base upon which a motor driven

MACKLIN

NUT-INSERTED WHEELS

Ease with which operator mounts a nut inserted Macklin Grinding Disc on the rigid steel back is shown in the upper left illustration. Ordinarily this mounting requires but a few moments of the operators time as against long fussing with cemented backs.

Macklin thick discs are manufactured exactly the same as grinding wheels and carry the same variety of sizes, grains and grades . . . . .

Illustration at right shows Macklin disc mounted and ready for rapid, safe operation.

MACKLIN COMPANY

Manufacturers of GRINDING WHEELS

Jackson, Michigan, U. S. A.

Sales Offices:—Chicago—New York—Detroit—Cincinnati—Pittsburgh—Cleveland—Milwaukee

blower is mounted to force air over an electric heating element. The heated air flows through the sand sample since the sample on which moisture is being determined is contained in a pan having a monel filter cloth bottom. The sand pan is held against the bottom flanged portion of the air tube by a spring loaded holder.

Three sand pans are supplied with the unit to permit the operator to weigh sand samples while the unit is drying a sample. Moisture determination may be made on any granular material such as molding and core sand mixtures, clays, coal dust, flour, and refractory mixtures.

• • •

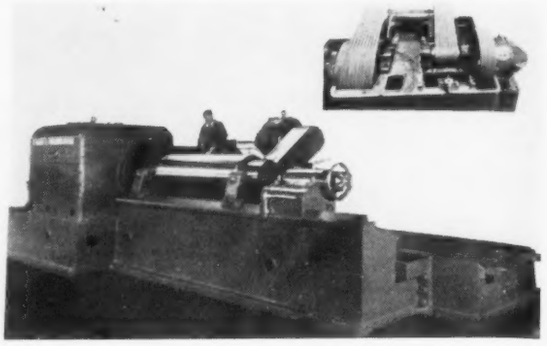
Density Comparator—Bausch & Lomb Optical Co., Rochester, N. Y., has introduced a new density comparator, an instrument designed for accurate and rapid quantitative spectrographic analysis. The unit is built as an accessory instrument to any spectrograph. Intensities of spectrum lines are measured by photoelectric means and the result is read directly from a scale. The equipment is free from the personal

Bausch & Lomb density comparator for spectrographic analysis

equation of the operator and the effects of fatigue which limit the accuracy of measurements made with visual photometers. Computations can be made at once without waiting for the development of a photographic paper or film.

The equipment consists of a projective system, a photoelectric cell for reception, a voltage regulator, and a sensitive galvanometer. The current for the standard unit is 110 volt, 60 cycle, alternating current. Provision is made for other voltages and frequencies.

A FEATURE of this Farrel - Birmingham roll grinder is a cambering device which produces a mathematically accurate curve for a crowned or concave roll, exactly symmetrical both sides of the center of the roll



• • •

Roll Grinder—Farrel-Birmingham Co, Inc., Ansonia, Conn., recently developed a new roll grinder. To eliminate vibration the 36-inch by 12-foot heavy-duty machine, shown above, is built with a multiple V-belt drive for rotating the rolls. According to the manufacturer, the performance of several of these machines so equipped has proved conclusively that a much better finish is obtained in a shorter time. In one steel mill rolls that formerly required five to six hours are now being finished in two hours with a perfect surface free from marks of any kind.

The headstock drive on this 36-inch machine is self-contained in one cast iron case mounted directly on the front bed. Three reductions, all of which are multiple V-belt drives, reduce the speed of the 300/1200 revolutions per minute motor to give a range of roll speeds from 11 to 44 revolutions per minute. The drive is equipped with antifriction bearings throughout, including the bearing supporting the large faceplate pulley. Bearings are mounted in adjustable housings and each of the three reductions can be adjusted separately to give the proper tension on the belts without the use of idler pulleys.

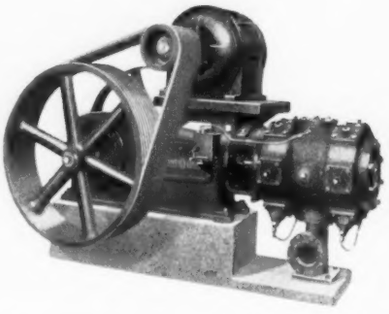
An improved type of flexible faceplate with balanced self-equalizing bar equipped with adjustable rubber-bushed driving dogs, compensates for inequalities in roll wabblers and automatically minimizes inaccuracies due to minor errors in setting the roll. Diameter of the grinding wheel has been increased from 30 to 36 inches so that at the same wheel surface speed the speed of the spindle is reduced, permitting a closer fit of the bearings and at the same time resulting in cooler running bearings.

• • •

Air or Gas Compressor—Pennsylvania Pump & Compressor Co., Easton, Pa., is bringing out a new air or gas compressor known as class 3-AT. It is of the single-stage, double-acting, horizontal, roller bearing type and is adapted for heavy duty service. The unit, shown herewith, is available in sizes from 5 to 125 horsepower and for pressures ranging from 12 to 150 pounds.

Crosshead is of the box type. Both top and bottom shoes are attached to the crosshead by tap bolts, and adjustment for wear is made by insertion of shims under the shoes and adjustment of the bolts. Crosshead guides are cast integral with the main frame and are bored in alignment with the cylinder centers and bearing housing fits.

Air cushion valves are employed. Guard and seat are locked together with a retainer ring of spring wire.



Pennsylvania class 3-AT air cushion valve compressor

Valves are mounted in the cylinder with a holding yoke, the arms of which bear upon the outer section of the assembly. This brings all pressure of the central holding set screw at the rim or strongest part of the assembly, preventing distortion or warping of the valve seats.

The compressor may be equipped for drive by short or long belt or multiple V-belt drive, with motor mounted overhead or in the same plane with the compressor; or it may be direct connected to a synchronous motor. Where the compressor is operated continuously at constant

speed the inlet valves are lifted and held open when the desired pressure is reached.

♦ ♦ ♦

Safety Switch — Cutler-Hammer Inc., 328 North Twelfth street, Milwaukee, has brought out a new safety switch designated bulletin 4140. As shown herewith, modern appearance is emphasized. Fully meeting all requirements for a 30-ampere switch and listed as standard by the Underwriters' Laboratories, the new addition to the line of control equipment of the company is particularly adaptable to oil burners, and to air conditioning equipment, electric unit heaters, as entrance switches and wherever a 30-ampere switch is used.

Although the switch is unusually small, 3½ by 5½ by 3½ inches, ample wiring space has been provided

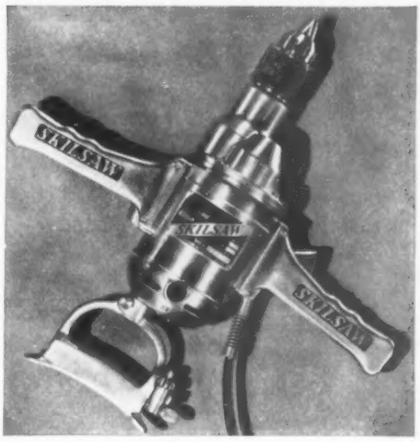
Cutler-Hammer safety switch is modern in appearance

to simplify installation. The toggle mechanism, front operated, is double pole, positive make and break, and the new switch is of the fusible type.

♦ ♦ ♦

Standard Drill—Skilsaw Inc., 3345 Elston avenue, Chicago, recently brought out a ⅝-inch standard drill, shown herewith. The motor employed is of the universal type for operation on direct current or alternating current, 60 cycles or less (all voltages) and the armature is statically and dynamically balanced to eliminate vibration. Field and armature windings are baked in bakelite and varnish.

The drill is housed in a die cast aluminum alloy body—a feature which provides increased strength and lighter weight, accuracy, interchangeability of parts, a dense surface and many other advantages. Other noteworthy features include: Compactness and light weight—15 pounds; free speed, 500 revolutions per minute; Jacobs chucks; motor cooled by balanced fan mounted on



New Skilsaw drill of ⅝-inch capacity in steel

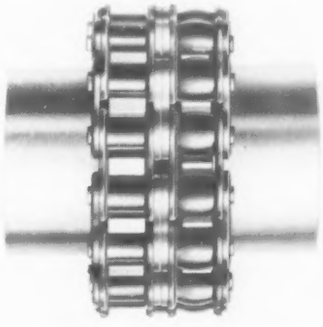
armature shaft, with effectiveness amplified by special baffle plate.

♦ ♦ ♦

Flexible Chain Coupling—Baldwin-Duckworth Chain Corp., Springfield, Mass., has developed a new flexible chain coupling that provides flexibility without friction and excessive noise. Results are accomplished by a special double width roller chain, shown below. One strand of the chain is equipped with the standard cylindrical rollers whereas the other strand has convex surface, oversize rollers which provide free operation where shaft deflection and misalignment exist. Permanent shaft deflections up to three degrees can be handled without undue strains. The coupling is self-aligning, and the convex rollers operate on hardened sprocket teeth.

♦ ♦ ♦

Mechanical Tack Hammer—Burgess Co. Inc., Beaver Falls, Pa., has placed on the market a novel tack hammer. Tacks are fed mechanically from an internal magazine and held in position until driven. Inside the head of the hammer is a magazine



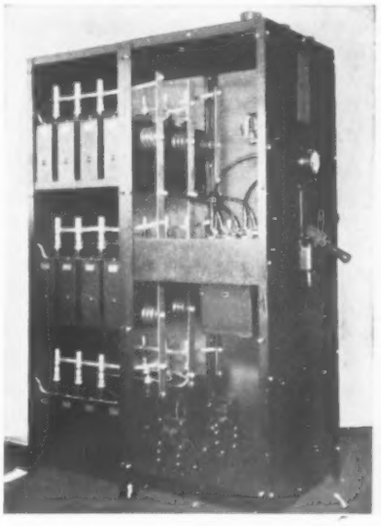
Baldwin - Duckworth patented flexible chain coupling

that carries a clip of fifty staples. When the user is ready for a staple the hammer is cocked by a simple wrist movement which ejects the staple from the magazine and rotates it into position on the hammer head.

Speed of the hammer is limited only by how fast the man holding the handle wants to work. The unit is balanced and light, weighing only ten ounces loaded with a full clip of staples. The clip is inserted into the magazine by placing the head of the hammer on a solid surface, pressing down the handle as far as it will go and then inserting the strip of staples into a groove. As each staple is driven the next one is rotated from the magazine into driving position by pressing down and forward on the handle.

♦ ♦ ♦

Power Capacitors—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is introducing a new line of hermetically sealed power capacitors, shown herewith. The individual units



Westinghouse capacitor complete with breaker, screens removed

are impregnated with a new fireproof impregnating medium interteen, are housed in welded cases of .05 sheet steel, and equipped with rugged solder seal porcelain terminal bushings.

The compact units are assembled in newly designed welded racks, frames, or cabinets for any sort of mounting including pole mounting. Since the engineering design is based on standard component parts, practically any size capacitor is available from 5 kilovolt amperes at 230 volts up to 1200 kilovolt amperes at 6900 volts.

1935 Directory Covers Iron And Steel Industry

Directory of Iron and Steel Plants, 1935 edition; fabrikoid, 291 pages, 5 x 7½ inches; supplied by STEEL, Cleveland, for $10, plus 15 cents for postage.

As in previous editions this directory presents a list of companies and officials operating blast furnaces, steel plants, rolling mills, by-product coking plants, structural steel plants, boiler and tank shops located in the United States.

The first section lists blast furnaces and steel plants alphabetically, with officers, plants, equipment and products. The second section is alphabetical by states and cities, with reference to entries on the preceding pages. Then follow by-product coking plants and allied industries also with geographical classification. The final classification covers structural steel, iron, boiler, tank and allied industries, also geographically keyed.

The volume is a handy reference with many uses for those having business relations with firms in these lines of business or seeking to make contacts with them. Names of company officials are given.

Grinding Equipment Is Aid To Saw Manufacturers

(*Concluded from Page* 26)

a wide-face set-up wheel. An oscillating table which also travels back and forth carries the saw under the wheel. Both oscillations and table travel are automatic as is operation of the clamps at each end of the saw to hold it in place. As the saw starts toward the wheel, the rear clamp swings over to hold the saw down. Then as the forward end of the saw emerges from under the wheel, the front clamp comes up, and when it engages the saw, the rear clamp drops so as not to interfere with polishing.

Steel for large band saws is purchased in strips, and before any processing operations are performed, the edges must be ground perpendicular to the face. Also the band must be brought to a predetermined width. Those operations are performed on a special machine, essentially a huge flywheel around which the roll of steel is fastened with clamps. Two adjustable grinding machines are located approximately in the plane of the flywheel shaft on opposite sides.

The flywheel containing the roll of steel is rotated slowly past the grinding wheels until the edges of the roll are ground perpendicular to the face. Then the roll of steel is taken from the flywheel, and reversed so that the other edges are presented to the grinding wheels. Enough stock is removed to bring the roll to the desired width.

Carbide Dies Contribute to Better Wire Drawing

(*Concluded from Page* 24)

to obtain grain structures that never can be obtained with cold drawing. It has been estimated that in hot drawing tungsten wire, 1 grain is elongated to about 50 inches of length. The possibilities of hot drawing are legion and it does not take much imagination to picture a large percentage of the wire which now is produced on large, heavy equipment, turned out in the not distant future, on light, compact hot drawing blocks.

Progress in the application of, and in the quality of results obtained from carbide dies, has been and still is being definitely made. The way is open to further development and greater benefits. However, the present status of cemented carbide die use clearly indicates that this material has found a place of definite value both to the wire producer and the wire user. The manufacturer of wire products who purchases his wire, is able to obtain a much more uniform and much more satisfactory product without increasing his cost of raw material, and the wire mill is able to turn out a much more satisfactory product at no increase in cost.

New Trade Publications

STEEL FLOORING AND GRIDS — Hendrick Mfg. Co., Carbondale, Pa., in a current bulletin illustrates and describes its various types of open steel flooring, treads and armorgrids.

HOISTS AND CRANES—Wright Mfg. division of the American Chain Co. Inc., York, Pa., has issued catalog No. 12 on its hoists, trolleys and cranes, with full illustrations and data tables.

DRAW-CUT MACHINE TOOLS—Morton Mfg. Co., Muskegon Heights, Mich., has issued bulletin No. 25-H on its draw-cut tools for railroad shops and No. 26-H on draw-cut machine tools for industrial shops.

SPECIAL STEELS — Firth-Sterling Steel Co., McKeesport, Pa., has issued a bulletin on its stainless steels, with a table of physical properties and working data and a table of drawing data. Another bulletin describes its toolholder bits of high-speed steel.

CENTRIFUGAL CLEANING — Pangborn Corp., Hagerstown, Md., has published a bulletin on its centrifugal blast cleaning machine. Information concerning centifugal cleaning is presented and 10 features of its blast cleaning equipment are presented.

MALLEABLE METAL — National Malleable & Steel Castings Co., Cleveland, has issued a leaflet illustrating the result of a test of elevator buckets made of Mallix iron, one of its alloys, and two other metals. The wear on the former was decidedly less than on the others.

GRINDING MILLS—Patterson Foundry & Machine Co., East Liverpool, O., in a current bulletin describes its ball, tube and rod mills for continuous grinding of bulk materials. Illustrations present the mills and their construction details and a table of sizes and specifications is included.

NIBBLING—Andrew C. Campbell division of American Chain Co. Inc., Bridgeport, Conn., has issued a catalog of its nibbling machines, with illustrations and comparisons of this process with others for obtaining irregular contours. Illustrations and specifications are included.

LUBRICATION — Merco Nordstrom Valve Co., subsidiary of the Pittsburgh Equitable Meter Co., Pittsburgh, has issued a bulletin describing lubricants for Nordstrom lubricated plug valves. It gives detailed information on correct types of lubrication for more than 300 kinds of service.

TOOL ROOM MACHINE—Pratt & Whitney Co., Hartford, Conn., has issued a circular on the Keller automatic tool room machine, type BL. Detailed description of the machine and its accomplishments is given, with ample illustrations of the machine and work accomplished by it.

CHAPLETS — Combined Supply & Equipment Co., 766 Grant street, Buffalo, has issued a booklet on its line of chaplets, including angle stem and double angle, single and double head, water back, radiator tin or ferrule chaplets, stove specialties, etc. The various types of equipment and styles are illustrated.

REFRACTORIES—Harbison-Walker Refractories Co., 1800 Farmers bank building, Pittsburgh, has prepared a folder on three of its refractory bricks. One type resists temperatures up to 2900 degrees Fahr., another up to 2500 degrees, and a third up to 2000 degrees. Bulk insulation also is discussed.

REFRACTORIES, CEMENT AND CRUCIBLES — Electro Refractories & Alloys Corp., Andrews building, Buffalo, has published an 84-page booklet devoted to its line of products. Part one deals with super refractories for temperature firebox linings, hearths and muffles, heat treating and annealing furnaces, linings for crucible furnaces, nonferrous furnaces, etc. The second section deals with high-temperature cement, the third section with crucibles, the fourth with electroalloys and the fifth presents reference tables. Considerable information especially to the nonferrous foundry field, is presented.

Orders Up in Number and Tonnage; Rate 53

Automotive, Container, Miscellaneous Demands Increase; Railroads, Structurals Hold Back—Scrap Prices Develop Easier Tone

STEEL orders last week continued to increase in number and tonnage, accompanied by renewed pressure from automobile manufacturers for deliveries, raising the steelworks operating rate 2 points to 53 per cent.

For the past eight weeks ingot output has expanded at an average of 3 points a week. The industry now is making steel at a rate 43 per cent higher than in all 1934. A considerable share of this improvement has come as a reaction from the low stage of stocks of materials and manufactured goods. Therefore, producers would not be surprised if the rate of gain should moderate. Steelworks scrap prices have experienced their first definite reaction since September.

Due to preponderance of automobile requirements, full-finished sheet output is up to 75 per cent, and strip steel to 65, while demand from container manufacturers sustains tin plate mills at 65 per cent. Two other props to heavy steel production, structurals and railroads, are conspicuously lacking.

Ford Raises February Schedule to 130,000; Larger Cold-Finished Sheet Orders Placed

The automobile industry last week made 69,000 cars, 3000 more than in the preceding week. Ford, 'way in the lead and turning out 5000 cars daily, has increased February schedules from 110,000 to 130,000, which would be its largest monthly production in nearly five years. Chevrolet's master models are expected off the assembly line next month, raising its output 50 per cent. A leading maker wanted to place 50,000 tons of full-finished sheets in the Pittsburgh district last week, but unable to obtain shipment from that source before three weeks, purchased 20,000 tons for February.

Pending decision on many public works projects and new government appropriations, structural steel requirements continue light, awards in the week amounting to 7746 tons, down from 14,222 tons in the preceding week. Including 5830 tons for the Los Angeles metropolitan water district and 1000 tons for the Alanta, Ga., housing project, concrete bar awards totaled 7940 tons. The General American Tank Storage & Terminal Co., Chicago, placed 2125 tons of plates for tanks at Houston, Tex.

From the chemical and oil industries considerable steel tonnage is expected this year. The chemical industry has authorized $100,000,000 expenditures for alterations and new plants, not far below the steel industry's own $125,000,000 new equipment appropriation. Need for modernizing many industrial plants is slowly opening up a huge reservoir of steel requirements. Demand for durable goods is increasing moderately. Miscellaneous steel commitments in the week included many from machine tool builders. The Tennessee valley authority has ordered $800,000 worth of electrical equipment.

25,000 to 50,000 Freight Cars Expected This Year; Two More Blast Furnaces Lighted

As nearly as builders have been able to determine, freight car awards this year will range between 25,000 and 50,000, compared with 23,829 last year. Railroads will have until 1938 to remodel or replace approximately 600,000 cars having arch-back trucks, a ruling by the Association of American Railroads banning exchange of these cars having extended the deadline to that year, instead of 1935. Cincinnati, New Orleans & Texas is inquiring for 300 automobile cars.

January pig iron shipments are 50 to 60 per cent above those of December. Japan is reported inquiring for 50,000 tons. Otis Steel Co. and Jones & Laughlin Steel Corp., are each blowing in a blast furnace.

The industry as a whole is a little less apprehensive of labor trouble, since the radical element is in revolt against the conservative leaders, and is trying to bring the radical smelter and mine workers' association into the amalgamated group, thereby reducing the union morale and diluting its leadership.

Steelworks operations in the Pittsburgh district last week advanced 5 points to 38 per cent. The Detroit district was up 29 points to 100 per cent; Wheeling 5 to 95; Youngstown 4 to 64; Chicago 3 to 59; Buffalo 2 to 44; Birmingham 2½ to 31½; eastern Pennsylvania 1 to 28½. Cleveland was down 3 to 79, while New England held at 68.

STEEL's iron and steel price composite is off 2 cents to $32.60, due to the reduction in scrap; the finished steel index remains $54, while the scrap composite is down 17 cents to $12.08.

COMPOSITE MARKET AVERAGES

	Jan. 26	Jan. 19	Jan. 12	One Month Ago Dec., 1934	Three Months Ago Oct., 1934	One Year Ago Jan., 1934	Five Years Ago Jan., 1930
Iron and Steel	$32.60	$32.62	$32.57	$32.39	$32.10	$31.15	$35.19
Finished Steel	54.00	54.00	54.00	54.00	54.00	51.10	55.63
Steelworks Scrap	12.08	12.25	12.08	11.02	9.40	11.24	14.16

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Jan. 26, 1935	Dec. 1934	Oct. 1934	Jan. 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.75c
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00

Pig Iron

	Jan. 26, 1935	Dec. 1934	Oct. 1934	Jan. 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	18.76
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2 foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	19.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	24.04	24.04	23.54	23.54
Ferromanganese, del. Pittsburgh	89.79	18.63	18.80	18.38
Gray forge, del. Pittsburgh	18.63	89.79	89.79	90.24

Scrap

Heavy melting steel, Pittsburgh	$13.75	$12.95	$10.50	$13.05
Heavy melt. steel, No. 2, east. Pa.	10.25	9.30	8.00	9.40
Heavy melting steel, Chicago	11.75	10.55	8.75	10.45
Rails for rolling, Chicago	12.75	11.65	8.90	11.25
Railroad steel specialties, Chicago	13.25	11.90	9.75	11.30

Coke

Connellsville, furnace, ovens	$3.60	$3.60	$3.60	$3.60
Connellsville foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, delivered	2.20c
Buffalo, delivered	2.03½c
Chicago or Gary	1.85c
Cleveland, del.	1.98½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, delivered	2.18½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	1.98½c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, delivered	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined	2.75-7.50c

REINFORCING

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve. 100 lb. keg

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot) □

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.....0.50
4600 0.20 to 0.30 Mo. 1.25 1.75 Ni. 1.05
5100 0.80-1.10 Cr 0.45
5100 Cr. spring .....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van.....1.50
Carbon Van. 0.95
9250....Carbon base plus extras

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops □

Hot strip to 23⅞-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base,	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c

Cooperage hoop,

Pittsburgh	1.95c
Chicago	2.05c

Cold-rolled strip,

Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 70-10-10 off
Rolled thread, ½ x 6 and smaller ..... 70-10-10 off

MACHINE BOLTS

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, ... 70-10-10 off
Tire bolts ..... 60-10 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch
Rolled thread machine bolts, ½ x 6 and smaller ..... 70-10-10 off
Step bolts ..... 70-10 off
Elevator bolts ..... 70-10 off

NUTS

S.A.E. semifinished hex.;
½ to ⅞-inch ..... 70-10-10 off
Do., ½ to 1-inch ..... 70-10-10 off
Do., over 1-inch ..... 70-10 off

HEXAGON CAP SCREWS

Milled ..... 85 off
Upset, 1-in., smaller ..... 85 off

SQUARE HEAD SET SCREWS

Upset, 1-in. small ..... 70-10 off
Headless set screws ..... 75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.25 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base....$100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville, fur.	$3.60- 3.85
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol		15.00c
Toluol		30.00c
Solvent naphtha		26.00c
Commercial xylol		26.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbl.	5.25c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25; 50-cent differentials apply to any grade below 1.75. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmgham.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham,	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem.	20.89	21.39	.....	.....
Philadelphia from Birmingham.	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Point: Philadelphia, standard and copper bearing 24.63
N. Y.—$23.50.
Basing Point: Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base, 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore □ □

LAKE SUPERIOR ORE
Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbes.	4.65

EASTERN LOCAL ORES
Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE
Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.,	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-18.50

Manganese Ore □

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK
First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00
Second Quality	
Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00
Ohio	
*First quality	$40.00-45.00
*Intermediary	37.00
*Second quality	28.00
MALLEABLE BUNG BRICK	
All bases	50.00
SILICA BRICK	
Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00
MAGNESITE	
Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00
BASIC BRICK	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5 □ □

Washed gravel, duty paid, tide, net ton	$19.50
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$15.50-16.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00

Spot, $5 a ton higher.

Silicomang., 2½ carb.	90.00

2% carbon, 95.00; 1%, 105.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

Old Metals □ □

Dcal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.37½-4.62½
Chicago	4.37½-4.62½
*Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	5.75- 6.00
Chicago, No. 1	5.50- 5.75
Cleveland	5.25- 5.50
St. Louis	5.50- 5.65
Composition Brass Borings	
New York	3.87½-4.12½
Light Copper	
New York	4.50- 4.75
Chicago	4.25- 4.50
Cleveland	4.50- 4.75
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.25- 2.50
Cleveland	2.50- 2.75
Lead	
New York	2.75- 2.85
Cleveland	2.75- 3.00
Chicago	2.75- 3.00
St. Louis	2.75- 2.90
Zinc	
New York	1.75- 2.00
Cleveland	1.75- 2.00
*St. Louis	2.25- 2.40
Aluminum	
Borings, Cleveland	7.50- 8.00
*Mixed, cast, Clev.	12.50-13.00
*Mixed, cast, St. L.	13.00-13.50
Clips, soft, Clev.	13.50-14.00

Secondary Metals □

Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	16.00-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00- 9.50
Boston, dock, expt.	9.00- 9.25
Boston, domestic	7.50-7.75
Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.25-10.75
Chicago, No. 1	11.50-12.00
Cleveland, No. 1	11.00-11 50
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.50- 9.00
Eastern Pa., No. 1	11.50-12.00
Eastern Pa., No. 2	10.00-10.50
Federal, Ill.	8.50- 9.00
Granite City, R. R.	9.50-10.00
Granite City, No. 2	7.50- 8.00
N. Y., deal. No. 2	7.00- 7.25
N. Y., deal. R. R.	8.50- 8.75
Pittsburgh, No. 1	13.50-14.00
St. Louis	8.00- 8.50
Valleys, No. 1	13.00-13.50

COMPRESSED SHEETS □

Buffalo, dealers	10.25-10.75
Chicago, factory	11.00-11.50
Chicago, dealer	10.50-11.00
Cleveland	11.00-11.50
Detroit	10.00-10.50
E. Pa., new mat.	10 00-10.50
Pittsburgh	13.50-14.00
St. Louis	7.00- 7.50
Valleys	12.50-13.00

BUNDLED SHEETS □ □

Buffalo	7.50- 8.00
Cincinnati, del.	7.00- 7.50
Cleveland	8.50- 9.00
Pittsburgh	12.00-12.50
St. Louis	5.00- 5.50

SHEET CLIPPINGS, LOOSE □

Chicago	6.00- 6.50
Cincinnati	6.50- 7.00
Detroit	5.00- 5.50
St. Louis	5.00- 5.50

STEEL RAILS, SHORT □

Birmingham	12.00-12.50
Buffalo	13.00-13.50
Chicago (3 ft.)	13.50-14.00
Chicago (2 ft.)	14.50-15.00
Cincinnati, del.	12.50-13.00
Detroit	12.00-12.50
Pitts., open-hearth, 3 ft. and less	15.50-16.00
St. Louis, 2 ft. & less	12.50-13.00

STEEL RAILS, SCRAP □

Boston	7.00- 7.25
Chicago	11.50-12.00
Pittsburgh	14.50-15.00

STOVE PLATE □ □

Birmingham	6.00- 6.50
Boston, dealers	3.25- 3.75
Buffalo	9.25- 9.75
Chicago, net	6.50- 7.00
Cincinnati, dealers	6.50- 7.00
Detroit, net	6.00- 6.50
Eastern Pa.	9.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	13.00-13.50
Chicago, springs	13.00-13.50
Eastern Pa.	14.50-15.00
Pittsburgh	15.50-16.00
St. Louis	10.50-11.00

ANGLE BARS—STEEL □

Chicago	13.00-13.50
St. Louis	11.00-11.50

RAILROAD SPECIALTIES

Chicago	13.00-13.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.00-13.50
Cleveland, billet, bloom crops	15.00-15.50
Eastern Pa., crops	15.00-15.50
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	14.50-15.00

FROGS, SWITCHES □ □

Chicago	11.50-12.00
St. Louis, cut	10.50-11.00

SHOVELING STEEL □ □

Chicago	11.50-12.00
Federal, Ill.	8.50- 9.00
Granite City, Ill.	7.50- 8.00

RAILROAD WROUGHT □

Birmingham	7.50- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	11.50-12.00
Chicago, No. 1, net	10.50-11.00
Chicago, No. 2	11.50-12.00
Cincinnati, No. 2	9.00- 9.50
Eastern Pa.	11.50-12.00
N. Y., No. 1, deal.	7.00- 7.50
St. Louis, No. 1	7.00- 7.50
St. Louis, No. 2	9.75-10.25

SPECIFICATION PIPE □

Boston	3.00- 3.25
Eastern Pa.	9.50-10.00
New York, dealers	3.50- 4.00

BUSHELING □ □

Buffalo, No. 1	10.25-10.75
Chicago, No. 1	10.50-11.00
Cinci., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1, new	8.50- 9.00
Valleys, new, No. 1	12.50-13.00

MACHINE TURNINGS □

Birmingham	4.50- 5.00
Boston, dealers	3.00- 3.25
Buffalo	5.50- 6.00
Chicago	6.50- 7.00
Cincinnati, dealers	4.50- 5.00
Cleveland	7.50- 8.00
Detroit	5.50- 6.00
Eastern Pa.	6.50- 7.00
New York, dealers	3.50- 3.75
Pittsburgh	9.25- 9.75
St. Louis	3.50- 4.00
Valleys	9.75-10.25

BORINGS AND TURNINGS □

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Cincinnati, dealers	4.50- 5.00
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.75- 7.25

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.50- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
E. Pa., chemical	12.00-13.00
New York, dealers	1.50- 1.75
Pittsburgh	6.75- 7.25
St. Louis	3.00- 3.50

PIPE AND FLUES □ □

Cincinnati, dealers	5.50- 6.00

RAILROAD GRATE BARS □

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	5.50- 6.00
Eastern Pa.	9.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS □ □

Boston, dealers	6.00- 6.25
Buffalo	10.00-10.50
Cleveland	9.50-10.00
Detroit	8.00- 8.50

FORGE SCRAP □ □

Boston, dealers	5.00- 5.25
Chicago, heavy	13.00-13.50
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	12.25-12.75

AXLE TURNINGS □ □

Boston, dealers	3.00- 3.50
Buffalo	7.00- 7.50
Chicago, elec. fur.	11.00-11.50
Cleveland	7.50- 8.00
Eastern Pa.	9.50-10.00
St. Louis	6.50- 7.00

STEEL CAR AXLES □ □

Birmingham	12.50-13.00
Boston, ship. point.	10.00-10.50
Buffalo	13.00-13.50
Chicago, net	16.00-16.50
Eastern Pa.	16.50-17.00
St. Louis	14.00-14.50

SHAFTING □ □

Boston, ship. point.	12.25-12.50
Eastern Pa.	17.50
New York, dealers	10.75-11.25
St. Louis	11.50-12.00

CAR WHEELS □ □

Birmingham	9.00- 9.50
Boston, iron deal.	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.50-13.00
Chicago, iron	12.00-12.50
Chicago, rolled steel	13.00-13.50
Cincinnati, iron	9.00- 9.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	14.50-15.00
Pittsburgh, iron	12.50-13.00
Pittsburgh, steel	15.50-16.00
St. Louis, iron	8.75- 9.25
St. Louis, steel	10.50-11.00

No. 1 CAST SCRAP □ □

Birmingham	9.50-10.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.50-11.00
Buffalo, mach.	12.00-12.50
Chicago, agri. net	9.50-10.00
Chicago, auto	10.50-11.00
Chicago, mach net	11.00-11.50
Chicago, railr'd net	10.00-10.50
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	12.50-13.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.50
Pittsburgh, cupola	13.50-14.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	9.00- 9.50
St. L., No. 1 mach.	10.25-10.75

HEAVY CAST □ □

Boston, del.	6.00- 6.25
Buffalo, break.	9.00- 9.50
Cleveland, break.	9.00- 9.50
Detroit, auto net	10.50
Detroit, auto net	9.50-10.00
Eastern Pa.	11.00
N. Y. break. deal.	6.50- 6.75
Pittsburgh	12.50-13.00

MALLEABLE □ □

Boston, consum.	10.00-10.50
Buffalo	12.50-13.00
Chicago, R. R.	13.50-14.00
Cincinnati, agri. del.	9.00- 9.50
Cleveland, rail	12.00-12.50
Detroit, auto	11.00-11.50
St. Louis, R. R.	10.50-11.00
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING □

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	8.00- 8.50
Buffalo	11.50-12.00
Chicago	12.50-13.00
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.75-11.25

LOCOMOTIVE TIRES □

Chicago (cut)	13.00-13.50
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS □

Buffalo	13.00-13.50
Chicago	13.50-14.00
Eastern Pa.	14.50-15.00
Pittsburgh	15.00-15.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin New York: Spot	Straits Tin New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Jan. 19	9.00	9.12½	7.50	51.10	50.70	3.70	3.55	3.75	*19.00	14.50	35.00
Jan. 21	9.00	9.12½	7.50	51.20	50.65	3.70	3.55	3.75	*19.00	14.50	35.00
Jan. 22	9.00	9.12½	7.50	51.10	50.75	3.70	3.55	3.70	*19.00	14.50	35.00
Jan. 23	9.00	9.12½	7.50	51.00	50.75	3.70	3.55	3.70	*19.00	14.50	35.00
Jan. 24	9.00	9.12½	7.50	51.10	50.75	3.70	3.55	3.70	*19.00	14.50	35.00
Jan. 25	9.00	9.12½	7.50	50.95	50.65	3.70	3.55	3.70	*19.00	14.50	35.00

*Nominal range 19.00c to 21.00c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland(c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.45c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS

Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
Milwaukee	3.41c
New Orleans	3.59c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
Milwaukee	3.41c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c

COLD. FIN. STEEL

Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
Milwaukee	3.61c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle(f) (d)	4.75c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs. extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Jan. 24

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.04 3 1 6	$13.78	1 14 0
Basic bessemer	13.45 2 15 0*	12.97	1 12 0
Hematite, Phos. .03-.05	15.28 3 2 6	.....	.....
SEMIFINISHED STEEL			
Billets	$26.90 5 10 0	$19.04	2 7 0
Wire rods, No. 5 gage	38.14 7 16 0	36.49	4 10 0
FINISHED STEEL			
Standard rails	$37.90 7 15 0	$44.60	5 10 0
Merchant bars	1.64c 7 10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.60c 7 7 6	1.13c	3 1 6
Plates, †¼ in. or 5 mm.	1.74c 8 0 0	1.51c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.02c 9 5 0	2.13c	5 16 0
Sheets, gal., 24 gage, corr.	2.45c 11 5 0	2.38c	6 10 0
Bands and strips	1.85c 8 10 0	1.46c	4 0 0
Plain wire, base	2.02c 9 5 0	1.96c	5 7 6
Galvanized wire, base	2.45c 11 5 0	2.30c to 2.33c	6 5 6 to 6 7
Wire nails, base	2.62c 12 0 0	2.11c	5 15 0
Tin plate, box 108 lbs.	$ 4.40 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.50	3 7 6(a)	$13.76	210	$14.38	310	$25.16	63
Basic bessemer pig iron	16.50	3 7 6(a)*	12.12	185	12.76	275	27.75	69.50(b)
Furnace coke	4.28	0 17 6	7.86	120	5.10	110	7.59	19
Billets	26.90	5 10 0	28.17	430	20.42	440	38.53	96.50
Standard rails	1.80c	8 5 0	2.08c	694	2.31c	1,100	2.39c	132
Merchant bars	1.87c	8 12 0	1.68c	560	1.16c	550	1.99c	110
Structural shapes	1.91c	8 15 0	1.65c	550	1.16c	550	1.95c	107.50
Plates, †¼-in. or 5 mm.	1.98c	9 1 3	2.10c	700	1.47c	700	2.30c	127
Sheets, black	2.29c	10 10 0§	2.55c	850‡	1.63c	775‡	2.61c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.83c	13 0 0	4.50c	1,500	3.15c	1,500	6.70c	370
Plain wire	2.02c	9 5 0	3.15c	1,050	2.31c	1,100	3.13c	173
Bands and strips	2.04c	9 7 0	1.95c	650	1.47c	700	2.30c	127

*Basic. †British ship-plates. Continental, bridge plates. 24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b hematite.

**Gold pound sterling carries a premium of 66.47 per cent over paper sterling.

Bars

Bar Prices, Page 44

Pittsburgh — Award of a number of large Mississippi river dams the past several weeks has released considerable forging work, which has advanced operations of several nearby drop forging shops. The automobile industry continues to take large quantities of bars for direct shipment and to supply partsmakers. The market is quoted 1.80c, base Pittsburgh, for carbon bars, and an unchanged 2.45c base on alloy quality.

Cleveland—Steel bar producers are encouraged by the diversity of orders from builders of material handling equipment. Machine tool manufacturers also are buying larger quantities. Heavier specifications are being issued by automobile manufacturers and forging shops.

Chicago—Bar sales and specifications show further gains, with improvement more diversified as miscellaneous consumers ask for larger tonnages. Demand from the automotive industry and farm implement manufacturers is increasing. Little difficulty is encountered by mills in giving fairly prompt delivery.

Boston—Commercial steel bar sales are small, but more numerous. Machine builders are buying more alloy bars. The Hartford, Conn., cold-finished steel producer continues active. Soft steel bar prices are unchanged at 2.20c, Boston. Bids close Feb. 1 on a round tonnage of corrosion-resisting steel bars for the Portsmouth, N. H., navy yard, schedule 4160.

New York—Awards for free machining steel bars, stainless and alloy steel for the Picatinny arsenal, New Jersey, opening of Dec. 21, include: Carpenter Steel Co., Reading, Pa., 4260 feet stainless steel bar, 33.4c pound; Crucible Steel Co. of America, New York City, 3780 feet stainless steel bar, 40.02c pound; Edgecomb Steel Corp., Newark, N. J., 4400 feet free machining steel bar, 3.2c pound and 15,120 feet strip steel, 3.95c pound; Columbia Steel & Shafting Co., Newark, N. J., 2900 feet free machining steel bar, 3.35c pound; Rustless Iron Corp. of America, Baltimore, 3200 feet stainless steel bar, 32.4c pound.

Philadelphia—Bolt and nut manufacturers are again releasing specifications for steel bars, as demand for their product has taken another spurt. Miscellaneous bar specifications are up and a betterment is noted in iron bars. Commercial steel bars are unchanged at 2.09c, Philadelphia, and common iron bars at 1.99c, Philadelphia.

Plates

Plate Prices, Page 44

Pittsburgh — Treadwell Construction Co., Midland, Pa., is low on 1998 feet of 20-inch discharge pipe for St. Louis army engineers on recent bids. Bids will be taken Feb. 5 on a large quantity of 28-inch i. d. flange pipe for the Kansas City army engineers' office to be delivered to the Fort Peck dam dredges. Most tank builders report a quiet period and small orders. Plates continue 1.80c, Pittsburgh.

Cleveland — Miscellaneous plate orders, though light, are more numerous, and tonnage appears to be increasing. Small fabricators and machinery builders are more active. Considerable demand from the oil and chemical industries is anticipated this year. Chemical companies are to spend $125,000,000 for alterations and new plants, $20,000,000 already having been contracted.

Boston—Plate demand still is sluggish with buying in scattered small lots. Tank requirements are lacking. There has been some gain for ship repairs and new building at navy yards.

New York—Miscellaneous plate tonnage is better although oil companies are taking less tonnage and railroad releases are moderate. The price is unchanged.

Philadelphia—Plate business is improving, with producers of coal shaker screens the latest to come into the market for substantial tonnage. Manufacturers of filling station equipment, noted last week as active, have followed with further substantial orders. The Baltimore & Ohio has placed 100 tons of car construction with an eastern Pennsylvania producer. An unconfirmed report is that new bids will be asked by the Erie railroad on the construction of its proposed ferryboat, estimated to require about 700 tons. Plates are 1.90c, Coatesville, or 1.98½c, Philadelphia.

Seattle —Movement of plates is fairly active, in small tonnages, the largest inquiry being for 4000 tons for the Tacoma water system extension, bids Jan. 31. Aberdeen, Wash., is preparing plans for rebuilding its system under a PWA grant of $177,000, calling for more than 9 miles of 28-inch pipe, steel, wood or concrete.

Standard Oil Co. will construct 10 bulk storage oil tanks and a warehouse at Coulee dam.

Contracts Placed

2125 tons, tanks, Houston, Tex., terminal General American Tank Storage & Terminal Co., Chicago, to Wyatt Metal & Boiler Works, Houston, Tex.

1380 tons, caissons, foundation, federal building, New York, to Petroleum Iron Works, Sharon, Pa.; George J. Atwell Co., contractor.

1200 tons, cracking stills for Shell Petroleum Co., St. Louis, to A. O. Smith Corp., Milwaukee; unstated tonnage of shapes for this project pending.

200 tons, 600,000-gallon tank, Cambridge, Md., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

140 tons, 300,000-gallon tank, Shelbyville, Ky., to Chicago Bridge & Iron Works, Chicago.

110 tons, boiler barges, Steel Oil Derrick Co. Ltd., New Orleans, to Pennsylvania Shipyards Inc., Beaumont, Tex.

100 tons, car construction, Baltimore & Ohio, to Central Iron & Steel Co., Harrisburg, Pa.

Contracts Pending

1429 tons, armor plate, bureau of ordnance, navy department, Washington, schedule 164, bids Jan. 28.

800 tons, Minnesota Mining Co., St. Paul.

500 tons, 6 to 14-inch pipe, Redmond, Oreg.; bids opened; alternate cast iron or wood.

120 tons, four tanks, Continental Distillery Co., Philadelphia; bids asked.

100 tons, oil storage tanks for Socony-Vacuum Oil Co. Inc., New York, for installation in the Philadelphia district; bids asked.

Unstated, nine miles 28-inch water pipe for Aberdeen, Wash.; alternate wood or concrete; plans in preparation.

Sheets

Sheet Prices, Page 44

Pittsburgh—A leading automobile manufacturer last week tried to place specifications for approximately 50,000 tons of full-finished sheets, but found that delivery in three weeks is the earliest producers could guarantee. Therefore, this buyer placed about 20,000 tons of full-finished sheets for delivery through February. Last week, sheet operations on full-finished grades held at a strong 70 per cent of capacity, with black sheets at 55 per cent, and galvanized about 40 per cent. Although sheet prices are unchanged, some mills favor including drawing extras on full-finished base prices, which would amount to an advance, in view of some deviations from drawing extras in the past.

Cleveland—Sheet mills here and in an adjacent lake district, still operating at capacity, are accumulating larger backlogs. Deliveries of wide cold finished material cannot be as-

sured in less than five to six weeks, and other automobile material in less than three to four. Individual orders from automobile manufacturers are increasing in size, with pressure for delivery. The market for enameling stock and other materials used in household equipment continues active.

Chicago—While sheet demand still is paced by requirements of the automotive industry, demand among other consumers continues to expand gradually. Pressure for delivery to automobile companies has increased, and mills find it increasingly difficult to satisfy desired deliveries, particularly of cold-rolled sheets on which shipments are deferred five to six weeks.

Boston—Miscellaneous demand, with slightly heavier shipments to jobbers has failed to increase sheet sales materially in New England. Warehouse distributors are not stocking heavily, pending second quarter price filings by mills about Feb. 18.

New York—Mill schedules are rapidly filling up due to large automobile requirements in the Middle West, stimulating inquiries and orders here. Bookings this month will exceed those of last month by substantial volume. A Binghamton, N. Y., washing machine manufacturer has increased output to 400 daily, with a corresponding advance in sheet requirements.

Philadelphia—Autobody tonnage again features sheet business. At least one seller here is unable to take further business for shipment in this quarter. Miscellaneous tonnage is slightly larger.

Buffalo—Sheet mills are operating at 60 to 70 per cent. Continued large production is anticipated for the quarter.

Cincinnati—Mills in this district are falling behind in deliveries of cold-finished sheets, with improvement in demand for other grades. Production is at about 80 per cent.

St. Louis—Producers and distributors report decided improvement in business, extending to virtually all products.

Birmingham, Ala.—Mill operations are steady. Dealers are inquiring for sheets.

Cold Finished

Cold Finished Prices, Page 45

Pittsburgh — January will record a gain of 55 to 60 per cent in cold-drawn bar specifications over December, according to experience of the several local producers. More jobbers are now buying cold drawn, adding to heavy orders from the automotive trade and manufacturers of farming equipment.

Transportation

Track Material Prices, Page 45

Prospects for freight car buying are indefinite but it is believed as many will be bought this year as last, estimates ranging from 25,000 to 50,000 cars. Cincinnati New Orleans & Texas of the Southern Railway System has issued an inquiry for 300 automobile cars of 40 tons capacity. Northern Pacific has placed six de-luxe light-weight coaches with Pullman Standard Car Mfg. Co., Chicago.

Pressed Steel Car Co., Pittsburgh, which late last week formally received contract for five light weight steel hopper cars from the Chicago, Burlington & Quincy advises that the design will be to the following specifications: 30,000-pound light weight, 139,000-pound load limit, 2605 cubic foot capacity (with 10-inch average heap) and a ratio of 81.9 per cent in maximum coal revenue load to gross weight. Each car will have a payload ratio of over 880 per cent, will measure 34 feet, 10 inches inside by 10 feet, 4 15/16-inch overall width, and car body top of 10 feet, 8 inches above rail. The cars will be carried on four-wheel trucks with 5½ by 100-inch journals.

New York Central has received a PWA award to increase its track-laying project from $2,500,000 to $3,706,000. The incerased funds will be used to buy 20,000 tons of rails and 9000 tons of fastenings. Great Northern has been awarded $80,000 additional by PWA to cover cost of roadway improvement for which $5,785,000 was granted in 1934.

Railroads will have until 1938 to remodel or replace approximately 600,000 cars having arch-bar trucks. The ruling of the Association of American Railroads banning such freight cars from exchange among roads has been changed to make the deadline three years hence instead of this year as originally set.

Prospects for buying of freight cars are indefinite but it has been estimated that 25,000 to 50,000 may be placed in 1935.

Car Orders Placed

Chicago, Burlington & Quincy, five light-weight hoppers, to Pressed Steel Car Co., Pittsburgh.

Northern Pacific, six coaches, to Pullman Standard Car Mfg. Co., Chicago.

Car Orders Pending

Baltimore & Ohio, 50 to 150 hoppers.

Chilean State Railways, 15 first-class passenger, six sleepers.

Cincinnati, New Orleans & Texas, of Southern Railway System, 300 automobile cars, 40 tons capacity; bids asked.

Rail Orders Pending

New York Central, 20,00 tons; 9000 tons fastenings; PWA award approved.

Pipe

Pipe Prices, Page 45

New York—New quotations will be taken on close to 1950 tons of cast pipe and fittings, Yonkers, N. Y., bids being declared informal last week. For a Brooklyn sewer about 900 tons has been placed by a contractor. New York city closes next week on two water line contracts for the Bronx, taking a fair tonnage, mostly steel pipe.

W. G. Cornell Co. here has been awarded heating contract for the federal building, requiring about 600 tons of pipe for heating, plumbing and sprinkler installations. The resale situation on merchant steel pipe shows some signs of becoming more stable.

Rio de Janeiro, Brazil, is inquiring for 12,500 tons of steel pipe.

Chicago—Practically no improvement has developed in cast iron pipe demand, the season still restricting the closing on proposed purchases by various municipalities. Prices generally are steady.

Basing discounts on a number of descriptions of line pipe recently were filed for Gary, Ind., for the first time, and became effective Jan. 20.

Boston—The New England cast pipe foundry has been awarded by blanket contract this year's requirements for Cambridge, Mass. The usual early-year inquiry by Boston will be delayed several weeks, substantial yard stocks still being on hand.

San Francisco—Some improvement is noted in the cast pipe market and several municipalities recently have come into the market, although tonnages involved are not large. It is expected that 600 tons of metal tubing for Grand Coulee dam in Washington will be placed during the first quarter.

Seattle—Federal grants are expected to stimulate demand for both cast iron and steel pipe in this area

in the near future. PWA funds have been approved for these Washington cities: Aberdeen, $177,000; Marysville, $57,000; Mabton, $42,000; Ridgefield, $21,000; Almira, $21,000; Sultan $20,000; Pateros, $18,400; Omak, $18,000.

Cast Pipe Placed

225 tons, 12 and 8-inch, Memphis, Tenn., to United States Pipe & Foundry Co., Burlington, N. J.

120 tons, 12-inch, Westfield, Mass., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

Steel Pipe Placed

1000 tons, approximately, 25,000 feet of 30-inch light weight, for pumping operations at San Jacinto, metropolitan water district, Los Angeles, to Western Pipe & Steel Co., Los Angeles.

Cast Pipe Pending

1950 tons, 30-inch and under with fittings, Yonkers, N. Y.; will be readvertised, former bids declared informal.

625 tons, 24-inch, force main, contract 7, Coney Island sewage plant, Brooklyn, N. Y.; bids to department of sanitation, New York, Jan. 28.

601 tons, 6 to 12-inch, class 150, Pasadena, Calif.; bids in.

472 tons, steel, iron or wood, 3½ to 8-inch, Veradale, Wash.; bids Feb. 1 to Paul S. Filer, Columbia building, Spokane, Wash.

390 tons, 30-inch, Washington; United States Pipe & Foundry Co., Burlington, N. J., low.

354 tons, 10 and 12-inch, class 150, Redwood City, Calif.; bids soon.

295 tons, 16-inch, class 150, Los Angeles, specification 1600; bids opened.

165 tons, 24-inch and under, Newark, N. J.

100 tons, special castings, etc., for 250 fire hydrants, Milwaukee; bids Feb. 7.

Unstated tonnage, new $50,000 waterworks system, Tigerton, Wis.; bond issue approved Jan. 15.

Steel Pipe Pending

12,500 tons, fabricated steel pipe, Rio de Janeiro, Brazil.

300 tons, 30-inch, Freeport, Long Island, N. Y.; bids in.

158 tons, copper-nickel alloy condenser tubes, bureau of supplies and accounts, navy department, Brooklyn, N. Y., Philadelphia, and Charleston, W. Va., bulk to Brooklyn; bids Feb. 1, schedule 4119.

Unstated tonnage, 1998 feet, 20-inch welded steel discharge pipe, for river and harbor work, U. S. engineer, Missouri district. Treadwell Construction Co., Midland, Pa., low.

Unstated tonnage, 1000 condenser tubes, ¾-inch diameter, 16 feet 2 inches long, Central Park avenue pumping station, Chicago; bids to commissioner of public works, Feb. 1.

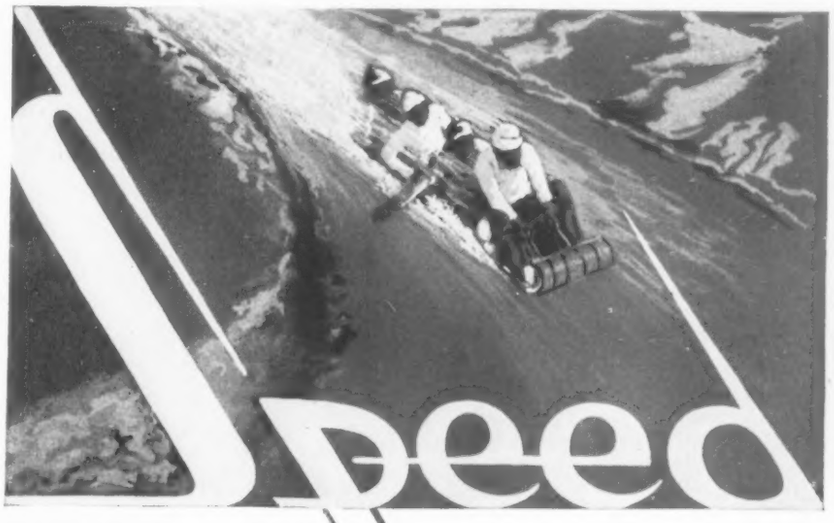
Unstated tonnage, 6700 feet of 48, 36 and 24-inch, and 10,000 feet of 48, 36 and 20-inch, two projects in Bronx, New York; bids week of Feb. 5.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 45

A heavy volume of bolt and nut specifications is on books of leading producers from a variety of buyers who entered blanket orders before the price increase Jan. 1. Recently it has been the bolt and nut producers' experience that specifications are being made sparingly, and the market has reverted to comparative quiet. The discount of 70-10-10 off list generally applies. There has been no recent development in large rivets at 2.90c, Pittsburgh, and Cleveland, 3.00c, Chicago, or in small rivets at 70.5 off list.

Chicago suppliers find heavy buying before the advance in price is limiting current inquiry. At Cleveland 80 per cent of business in nuts and bolts is from automobile interests.



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Shapes

Structural Shape Prices, Page 44

New York—Structural awards are heavier, led by 2400 tons for a New York municipal pier. For a west-side New York Central railroad project, 9500 tons will soon be awarded.

Pittsburgh — Rust Engineering Co., Pittsburgh, took bids until Jan. 24 on 1500 tons of structural shapes for new buildings to be built at Mount Vernon, O., for the Pittsburgh Plate Glass Co., Pittsburgh. Plain structural material holds at 1.80c, Pittsburgh, but fabricating prices are widely divergent.

Cleveland—Government engineers are seeking $10,000,000 for Great Lakes harbor improvements this year, which is expected to develop a substantial tonnage of steel piling. Two industrial plants in Ohio are being figured, 1500 tons for the Pittsburgh Plate Glass Co., Mount Vernon, and 600 tons for the Timken Roller Bearing Co., Cambrinus.

Chicago—While occasional gains are noted in orders for small lots of fabricated steel, the number of larger awards lacks improvement and both bookings and inquiries hold to the low level prevailing during the past several weeks. A post office at Phoenix, Ariz., will take 1250 tons.

Boston—Structural awards include 325 tons for state buildings, Rhode Island. New inquiry is not encouraging.

Philadelphia—Bids will be opened this week on the naval aircraft factory here, requiring at least 1500 tons of shapes and approximately 400 tons of reinforcing bars, and on 470 tons of shapes for a local post office. Shape mill operations continue slow, but an increase particularly in small truck shipments is reported. Shapes are steady at 1.90c, Bethlehem, Pa., or 2.00½c, Philadelphia.

Approximately 2000 tons of steel for cots have been distributed by the local quartermaster's department to fabricators in Chicago and Buffalo.

San Francisco—Structural awards on the Pacific coast aggregated less than 1000 tons. Among the important pending projects are 3412 tons for a water district in Phoenix, Ariz. Mare Island, Calif., navy yard will open bids Feb. 13 for a 40-ton gantry crane, requiring 200 tons of structural material.

Seattle—Montana highway department opened bids Jan. 25 for several bridge projects including a 230-foot steel and concrete span over the Stillwater river and a steel bridge, 898 feet long, over the Flathead river, involving about 687 tons. Pierce county, Washington, has rejected tenders for a steel and concrete structure over the Mashel river and is asking new tenders.

Shape Contracts Placed

2400 tons, pier 45, department of docks, New York, to McClintic-Marshall Corp., Bethlehem, Pa.; Caldwell-Wingate Co., New York, general contractor.

800 tons, bridge, Joliet, Ill., for Santa Fe railroad, to American Bridge Co., Pittsburgh.

560 tons, bridge 61TR-NRH-471A, St. Louis county, Missouri, to Mississippi Valley Structural Steel Co., Decatur, Ill.

400 tons, bridge, Havana, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

370 tons, bridge NRS 409-A, Caddo county, Oklahoma, to Capital Steel & Iron Co., Oklahoma City.

310 tons, powerhouse, state reformatory, Elmira, N. Y., to American Bridge Co., Pittsburgh, Pa.

250 tons, additional, gate hoists, Boulder dam, Boulder City, Nev.; specification 604, to Consolidated Steel Corp., Los Angeles.

250 tons, wharf shed for government, Honolulu, T. H., to unnamed interest.

230 tons, highway project 537-A, Augusta, Ga., to Southern Engineering Co., Atlanta, Ga.

200 tons, standard shapes, principally for whiskey barrel racks, Continental Distillery Co., Philadelphia, to American Steel Engineering Co., Philadelphia.

195 tons, state highway bridge, Durand, Mich., to R. C. Mahon Co., Detroit.

195 tons, employes dormitory, state hospital, Howard, R. I., to Bethlehem Fabricators Inc., Bethlehem, Pa.

170 tons, city bridge, Carpentersville, Ill., to Midland Structural Steel Co., Chicago.

165 tons, bridge NRH 207-B, Tillman county, Oklahoma, to Capital Steel & Iron Co., Oklahoma City.

165 tons, pier development for Du Pont interests, Edge Moor, Del., 120 tons of piling to Kalman Steel Corp., Bethlehem, Pa., and 45 tons of structurals to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, bulkhead gates, Boulder dam, Boulder City, Nev., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, highway bridges, Georgia, one in Peach county, to Bethlehem Fabricators Inc., Bethlehem, Pa., Leo T. Barber, Moultrie, Ga., general contractor.

150 tons, warehouse, J. H. Kenny Co., Philadelphia, to Belmont Iron Works, Philadelphia.

136 tons, state office building addition, Providence, R. I., to Bethlehem Fabricators Inc., Bethlehem, Pa.; O. D. Purington Co. Inc., Providence, general contractor.

130 tons, postoffice, Portsmouth, O., to Portsmouth Structural Steel Co., Portsmouth, O.

125 tons, Sol Duc river bridge, Washington, to Steel Fabricators Inc., Seattle.

110 tons, state highway bridge, Springville, Utah, to American Bridge Co., Pittsburgh.

105 tons, building addition, Eaton Mfg. Co., Detroit, to R. C. Mahon Co., Detroit.

100 tons, grain elevator, Cedar Rapids, Iowa, to Gage Structural Steel Co., Chicago.

100 tons, plant addition, Celanese Corp., Amsel, Md., to Belmont Iron Works, Philadelphia.

Shape Awards Compared

	Tons
Week ended Jan. 26	**7,746**
Week ended Jan. 19	**14,222**
Week ended Jan. 12	**9,246**
This week in 1934	**15,990**
Weekly average, 1934	**16,284**
Weekly average, 1935	**13,809**
Weekly average, December	**9,078**
Total to date, 1934	**69,923**
Total to date, 1935	**55,237**

Shape Contracts Pending

8000 tons, elevated express highway section, New York; Poirier & McLane Corp., New York, low.

8000 tons, completion of Wabash railroad bridge over Missouri river, St. Charles, Mo.; PWA loan granted.

3412 tons, Maricopa county water conservation district, Phoenix, Ariz.; bids opened.

1650 tons, track depression, New York Central, Manhattan (New York), P. T. Cox Contracting Co., New York, low.

1500 tons, buildings, Mount Vernon, O., for Pittsburgh Plate Glass Co., Pittsburgh, Rust Engineering Co., Pittsburgh, general contractor. Steel bids were taken until Jan. 24.

1290 tons, bridge, Lafayette river, Hampton boulevard, Norfolk, Va.; T. A. Loving & Co., Goldsboro, N. C., low, $316,450.

1250 tons, postoffice, Phoenix, Ariz.

950 tons, steel sheet piling, 38.8 pounds per linear foot, Tennessee valley authority, Knoxville, Tenn., for Pickwick Landing dam; bids Feb. 4.

900 tons, state bridges, Missouri.

700 tons, state highway bridge, Kalispell, Mont.

687 tons, two state bridges, Flathead county, Montana; bids opened.

600 tons, extension for Timken Roller Bearing Co., Gambrinus, O.

470 tons, Northside postoffice, Philadelphia; bids Feb. 1.

400 tons, school, Calumet City, Ill., Duffin Iron Co., Chicago, low.

400 tons, bridge over Sag channel, Lemont, Ill.; Duffin Iron Co., Chicago, low.

400 tons, six-span bridge, Elmore, W. Va., for Virginian railroad.

300 tons, Mayview hospital, Pittsburgh; William Miller, Pittsburgh, awarded general contract.

275 tons, 207-foot bridge, Naugatuck river, Beacon Falls, Conn.; bids in, state highway commissioner.

250 tons, hospital unit, Greenpoint hospital, Long Island City, N. Y.

250 tons, shapes and bars, Cross street school, Somerville, Mass.; Matthew Cummings Co., Boston, general con-

tractor.

240 tons, bridge, Villa Grove, Ill.; Mississippi Valley Structural Steel Co., Decatur, Ill., low.

200 tons, Foster avenue bridge, Chicago; M. J. McDermott & Co., Chicago, low for general contract.

200 tons, 40-ton gantry crane, Mare Island, Calif., specification 7855; bids Feb. 13.

180 tons, shapes and bars, highway projects, Rankin-Scott and Simpson counties, Mississippi; bids Jan. 29.

175 tons, state highway bridge, Big Stone Gap, Va.

150 tons, state highway bridge, Akron, Colo.

133 tons, including machinery, Bonneville, Oreg., locks span; McRae Bros., Seattle, low.

125 tons, Alice Deal junior high school, Washington, Birchett & Atkins, Washington, low.

120 tons, state bridge, route 3, Crooked run, Warren County, Virginia; bids Feb. 7.

120 tons, school, Wilson, N. Y. bids in February.

Unstated, warehouse for Coulee, Wash., dam site; bids at Almira, Wash., Feb. 11.

Reinforcing

Reinforcing Bar Prices, Page 45

Pittsburgh — A heavy volume of small postoffices and additions are being released by the treasury department, requiring sizable lots of reinforcing bars and joists. Small projects generally are more active and the market is firmly quoted on the basis of 2.05c, Pittsburgh, for new billet bars through distributors, and 1.90c, Pittsburgh, for rail steel.

Chicago—Delays are encountered in the placing of reinforcing bars for a number of public projects involving a fairly large tonnage. In most instances road work in Illinois will not start until later in the quarter.

Cleveland—United States engineers, Zanesville, O., will take bids on 2600 tons Feb. 5, for six dams in the Muskingum, Ohio, conservancy district. Bids from 34 mills and jobbers on 1000 tons for four bridges taken recently, all uniform, were rejected. It is understood no bids will be accepted from jobbers on the 2600 tons. Aside from some small municipal work in and nearby Cleveland the market is quiet.

Boston — For bridges and highways approximately 400 tons of reinforcing steel has been placed, although several projects requiring larger volume still pend. New inquiry is light.

New York — For Triboro bridge piers bids close Feb. 14 on contracts requiring 750 tons of bars. Former tenders were cancelled, and the new opening includes additional requirements for Harlem river piers in addition to those on Randall's Island and Little Hell Gate. Awards last week were slightly heavier.

Philadelphia — Reinforcing bar sellers here are centering interest on openings this week of 400 tons for the naval aircraft factory in Philadelphia. Billet steel bars, cut

Concrete Awards Compared

	Tons
Week ended Jan. 26	7,940
Week ended Jan. 19	2,489
Week ended Jan. 12	6,560
This week in 1934	2,934
Weekly average, 1934	4,084
Weekly average, 1935	4,482
Weekly average, December	2,408
Total to date, 1934	19,449
Total to date, 1935	17,927

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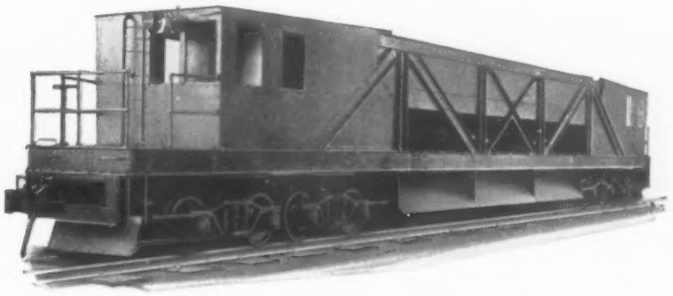

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lengths, are 2.05c, Pittsburgh, or 2.34c, Philadelphia.

Cincinnati — For a liquor warehouse at Lawrenceburg, Ind., 400 tons will be required, Frank Messer & Sons Inc., Cincinnati, general contractor. Choice of alternate specifications, however, may reduce the amount of steel. Plans call for the largest liquor warehouse in the United States, distillery officials said.

San Francisco—Award of 5830 tons for the metropolitan water district, Los Angeles, features the market. Highway and bridge work in California from July 1, 1935 to June 30, 1937 calls for an expenditure of over $37,000,000 and will require a large tonnage of reinforcing bars and shapes.

Seattle—Business continues slow, only small tonnages pending, but prospects for increased activity have improved. Sound Construction & Engineering Co., Seattle, is low at $286,240 for completion of Seattle's city light building which will require 200 tons of concrete bars, not yet purchased.

Reinforcing Steel Awards

5830 tons, metropolitan water district, Los Angeles; 2075 tons of rail steel to Truscon Steel Co., Youngstown, O.; 2075 tons rail steel to Security Materials Co., Los Angeles, and 1680 tons billet steel to Soule Steel Co., Los Angeles.

1000 tons, Atlanta, Ga., housing project, to Atlantic Steel Co., Atlanta; through J. A. Jones, Charlotte, N. C.

390 tons, viaduct over Southern and Louisiana & Nashville tracks, Birmingham, Ala., to Truscon Steel Co., Youngstown, O., and Concrete Steel Co., Birmingham; W. C. Howton Contracting Co., Birmingham, general contractor.

243 tons, Nine-mile creek improvement, East Cleveland-Cleveland, O., to Patterson-Leitch Co., Cleveland.

210 tons, state highway and bridge, Boston-Dedham, Mass., to Truscon Steel Co., Youngstown, O.; Arute Bros. Inc., Bridgewater, Mass., general contractor.

140 tons, substructure, state bridge over Boston, Revere Beach & Lynn railroad, Revere, Mass., to Northern Steel Co., Boston.

127 tons, state crossing, Pinal county, Arizona, to unnamed interest.

Reinforcing Steel Pending

3500 tons, Moffatt tunnel, Colorado; bids opened.

2600 tons, six dams in Muskingum, Ohio, conservancy district, bids to United States engineers, Zanesville, O., Feb. 5. Previous bids on 1000 tons rejected.

1000 tons, state highway bridge, Ottumwa, Iowa. State highway department undecided on reinforcing bar or structural design. Wisconsin Bridge & Iron Co., Milwaukee, low on structural basis, but bids likely to be readvertised.

750 tons, piers, Triboro bridge, Randall's Island, Little Hell Gate and Harlem river, New York; bids Feb. 14 to Triboro bridge authority, New York. Former bids on Randall's Island and Little Hell Gate piers cancelled.

485 tons, Maricopa county water conservation district, Phoenix, Ariz.; bids opened.

450 tons, bright ungalvanized steel wire strand, schedule 35-219, U. S. engineer Memphis, Tenn.; bids in Dec. 28, probably will be readvertised.

225 tons, state highways and bridges, Georgia; bids Feb. 1.

200 tons, Park school, San Francisco; bids opened.

Strip Steel

Strip Prices, Page 45

Pittsburgh—Strip steel producers are falling farther behind on deliveries and the best several mills can now promise is three weeks, even on hot-rolled. Cold-rolled deliveries on spot business in many cases are now four to five weeks. Strip steel capacity on the average here is engaged at close to 70 per cent and most smaller mills are operating three full turns. No report of change from 1.85c, Pittsburgh base, on hot strip, or from 2.60c, Pittsburgh or Cleveland, on cold strip is heard.

Cleveland—Demand for wide cold-rolled strip from the automobile industry is strong, mills here operating at capacity. Specifications for hot-rolled material, however, have slowed up, consumers having acquired fairly good stocks during the recent rush in shipments. Other requirements are quiet.

Chicago—Strip production is increasing to meet heavier shipments requested by most consumers. Producers of cold-rolled strip are particularly active, with deliveries in some instances delayed due to heavy requirements of the automotive industry. Demand for hot-rolled strip has improved sharply since a month ago and producers generally are well booked for a short period ahead.

Boston—Cold-rolled strip demand is improved slightly, with buyers specifying close to requirements. Hot-rolled strip buying lags behind expectations.

New York—Narrow strip is moving slowly with prices steady and conditions generally satisfactory.

Tin Plate

Tin Plate Prices, Page 44

Pittsburgh—A steady run of tin plate specifications continues to be placed by leading canmakers, and production is at a strong 65 per cent rate. Many producers are trying to build up order backlogs. Tin mill products are firm at $5.25, per base box, for tin plate; 2.75c per pound on waste-waste tin plate, and 2.50c on tin plate strips. Unassorted No. 24 long ternes are 3.40c, Pittsburgh.

Wire

Wire Prices Page 45

Pittsburgh—Regulation 36 to the steel code, effective Jan. 24, provides an optional charge by the producer of $4 per ton on all less-carload merchant wire product shipments for resale within a mill basing point or recognized jobbing center. Heavy demand for manufacturing wire continues with spoke wire, spring wire and other materials used by the automobile industry making up most of wire mill shipments.

Cleveland—Wire mills are operating at an average of about 50 per cent, though some departments are working at 75. Demand for manufacturers' wire is well sustained.

Chicago—Wire demand continues active and mills have found it necessary to increase production. Demand is best from the consumers of manufacturers' wire, activity in this commodity being well diversified but relatively heaviest to automotive interests. Slightly better orders are appearing from jobbers. Demand still is for fairly early needs.

Boston—Wire buying continues active with a gradually widening demand. Operations have been increased in some departments. Specialty and manufacturers' wire holds to the recent rate. Prices are unchanged.

New York—Wire products are more active, the past week bringing a decided gain. Prices are steady.

Philadelphia—The spring wire department of one eastern producer is said to be operating now at close to 100 per cent, demands coming principally from automobile manufacturers. A 5-cent increase in the less-than-carlot differentials on nails has gone into effect, increasing them to 15 cents. Nail demand continues sluggish.

Semifinished

Semifinished Prices, Page 45

With strip steel finishing operations at above 65 per cent, full-finished sheets at 75 per cent, and tin plate capacity engaged at 65 per cent, there is a heavier demand for billets, sheet and tin bars. Wire rods and skelp are sharing in the improvement, but blooms and slabs

are slow. Pittsburgh base prices follow: Rods, $38; billets and slabs, $37; sheet bars, $28; and forging-quality billets $32. Alloy billets, slabs and blooms are $49, Pittsburgh, and uncropped alloy ingots $40.

Pig Iron

Pig Iron Prices, Page 46

Pittsburgh—A fair demand for steel mill rolls, however, is apparent in the Pittsburgh district, although basic iron orders from several of the nonintegrated steel producers are lacking. Only one merchant furnace is in blast here and the integrated steelworks continue to influence the merchant market. Prices quoted are $18.50, Pittsburgh district furnace, for foundry iron, $19 on bessemer and $18 for basic.

Cleveland—January pig iron shipments will be 50 per cent larger than the tonnage moved by lake furnace interests last month. New bookings, however, are only 60 per cent of those in December, when many melters placed contracts. During the week 7000 tons was entered by a merchant furnace interest here, in moderate size lots, mainly for automobile foundries.

Chicago—Pig iron shipments show substantial gains. Compared with December, deliveries are up about 60 per cent while the increase over January last year, when purchases were restricted by heavy tonnages received late the preceding quarter, is even more substantial. Betterment in foundry operations is broadening gradually. New business is in keeping with the better rate of shipments, orders generally covering definite requirements. The market continues $18.50, furnace, for No. 2 foundry and malleable.

Boston—Carload shipments of pig iron are more numerous, but total volume placed by consumers is still conservative. Foundry melt in the district averages about 50 per cent, a few jobbing shops being exceptions. Machine shop foundries and those making castings for machine builders offer the best, but still uncertain, outlook for better buying in the immediate future

New York—While pig iron tonnage is responding slowly to seasonal influences, most sellers will be able to report an improvement for the month now closing. Orders still are confined chiefly to small lots of 100 tons and less for prompt shipment. Prices are unchanged.

Philadelphia—Pig iron sellers report that shipments for January will show an increase over December, although the improvement generally has been disappointing. Two eastern Pennsylvania merchant producers are reported to be planning for resumption of production within the next few weeks, but definite information is lacking. Prices are steady.

Cincinnati—Heavier shipments of pig iron this month, estimated at 25 per cent above December, are holding. Melters not covering for first quarter early in January are buying small lots for prompt shipment.

Buffalo—Inquiries are broadening and purchasing is on a steadily rising trend. Shipments likewise are improving steadily. There is a report that a local merchant producer will add a second stack to the one now in production before the end of this quarter. Five furnaces are now in operation.

St. Louis—Shipments of pig iron to melters in this area continue the steady expansion noted since the first week of January. New purchasing has subsided but sellers report customers' stocks are light.

Birmingham, Ala.—Melters are continuing the policy of buying only as needs dictate, but a more active movement of iron is noted. Production is being maintained by five blast furnaces, three on foundry and two on basic. Plans call for two additional furnaces between now and the last of the month or a week later.

Toronto, Ont.—While merchant pig iron sales are holding at a steady level, no large tonnage contracts are being closed. Foundries are maintaining steady production with the daily melt between 35 and 40 per cent.

Scrap

Scrap Prices, Page 47

Pittsburgh—With scrap melters supplied for the time being, brokers have forced their offering prices down to $12.75 to $13 for coverage on No. 1 steel for orders. There has been no development, however, among mill buying prices to have altered the $13.50 to $14 range on No. 1 heavy melting steel, and it is doubtful if considerable tonnage could be bought at less than this figure.

Cleveland—A Cleveland steelmaker has bought a small tonnage of heavy steel and blast furnace material at

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about the current market, divided among several dealers. Shipments are going forward on contracts, especially to the Valleys. Softness of the past few days is disappearing and strength is appearing in prices, which are unchanged.

Chicago—Scrap is quieter following its recent downward trend in prices, and new business is light considering activity at open-hearth plants. The overbought situation among sellers is expected to be corrected shortly. Sellers are able to pick up No. 1 heavy melting steel at $11.50 and this market is $11.50 to $12. Railroad offerings are light.

Boston—Higher domestic price for heavy melting steel has checked movement of scrap for export from points beyond immediate shipping ports. The Worcester, Mass., steel works is buying substantial volume of No. 2 melting scrap at $8.25 to $8.50, delivered, and for tonnage, offers $9.50 for No. 1. Prices are strong with advances on several grades.

New York—Scrap prices are firm with an advance on turnings and strong heavy melting steel quotations despite some decline in activity. Buying for export is less brisk, and, while $9, barge, is generally paid for No. 1 heavy melting scrap, some business has been done at $9.25. Scattered buying of No. 2 has bettered $7.50, barge. From New Jersey points No. 2 melting steel is moving to eastern Pennsylvania. The advance in turnings follows better bids for Pittsburgh delivery.

Philadelphia—Scrap prices have been advanced on heavy breakable cast, knuckles and couplers, steel shafting and rolled steel wheels. No. 1 heavy melting steel is unchanged at $11.50 to $12, delivered, consuming plant, with the top price the more representative. No. 2 steel is steady at $10 to $10.50.

Buffalo—Purchases of heavy melting steel continue with $12 the ruling price for No. 1 and $10.50 offered for No. 2. Dealers report difficult in replacing stocks at these levels and are endeavoring to boost prices. Other grades have increased about $1 per ton in recent deals and the entire market is developing.

Detroit—Prices are fairly steady, the market being in a waiting period, pending developments in other districts. The sharp increase in production of scrap by motor plants so far has had little adverse influence on this market. No. 1 heavy melting steel continues $9.50 to $10, with hydraulic compressed sheets $10 to $10.50.

Cincinnati—Iron and steel scrap has turned soft, although quotations are nominally unchanged. Some dealers who were holding material tightly are seeking purchasers.

St. Louis—While quotations have not been changed, the tone of iron and steel scrap is noticeably easier. Dealers are more willing to sell, but melters continue to resist current price levels, and only scattering small lots have moved.

Seattle—The scrap export market continues inactive. However, sentiment is strong, exporters believing that demand will be active soon. Inquiries from Japan indicate buyers are out of line in their ideas of price. No. 1 melting steel is still quoted at $8.75 to $9 f.o.b. here.

Birmingham, Ala.—Demand for steel and iron scrap is light and prices are steady on most grades.

Toronto, Ont.—Improvement in demand is reported for iron and steel scrap in the Toronto and Montreal areas. Hamilton mills are taking larger tonnages of heavy melting steel and it is expected soon will be in the market for turnings. Large stocks that were accumulated from the railroads a couple of years ago have been cleaned up and offering last year were light. Foundries are taking No. 1 cast scrap and there is fair demand for wrought scrap. Prices are unchanged.

Warehouse

Warehouse Prices, Page 48

Pittsburgh—The resale market on wire products was affected last week by the adoption of Regulation 36 to the steel code providing for the optional charge by the merchant wire producing mill of $4 a ton to the buyer on all less-carload merchant wire product shipments intended for resale within a recognized jobbing center or a mill basing point district. Jobbing business in the Pittsburgh district is expanding. Prices are nominally unchanged.

Cleveland—Orders and tonnage show further substantial improvement. Leading sellers report tonnage considerably better than in December. Demand for cold-rolled bars is good.

Chicago—Sales continue relatively brisk and heavier than during December or January a year ago. Demand recently has been more diversified. Prices are unchanged.

Philadelphia—Some jobbers report improvement over December, while others point to a decline. Boiler tubes out of warehouse have been reduced.

New York—Warehouse volume has gradually improved during the last 10 days and some jobbers will surpass last month's total sales. Buying continues well spread with small orders predominating.

Detroit—Business has improved moderately and makes a favorable comparison with preceding months and with January last year.

Cincinnati—Steel warehouses in Ohio will be required to have a vendor's license, under the new state sales tax law, and assess the tax on materials sold to building contractors, under an interpretation received here. Demand from jobbers continues to improve over recent months.

St. Louis—Stimulated by the zero weather, orders for seasonal items booked by warehouses have increased substantially during the past week.

Metallurgical Coke

Coke Prices, Page 45

By-product coke producers have had a heavier call from wholesalers for domestic heating fuel during recent cold weather, but prices to distributors continue unsettled. Metallurgical coke reflects little change and the following Connellsville, Pa., oven prices continue to govern: $3.85 for furnace grade, $4.60 for common foundry grade and $5.10 to $5.35 for premium foundry.

Foundry coke shipments have increased at Chicago, about 50 per cent larger than in January last year. Foundries at Cincinnati also are taking heavier tonnages of by-product fuel. Jobbing foundries and stovemakers in the St. Louis area are filling larger requirements. Indications at Birmingham, Ala., are for increased production to meet demand.

Ferroalloys

Ferroalloy Prices, Page 46

The market for terromanganese is strong, New York reporting an increase in specifications and shipments.. Ferroalloy prices are firm.

Coke By-Products

Coke By-Product Prices, Page 45

New York—Contract shipments of coke oven by-products tend upward, with naphthalene inclined to lag. Most prices are unchanged and steady, naphthalene again being an exception with some shading of the recently reduced quotation reported. Toluol demand is brisk and several

distributors are not able to take spot shipments. The better industrial demand for phenol continues, while sulphate of ammonia contract releases register some gains.

Nonferrous Metals

Nonferrous Metal Prices, Page 46, 47

New York—Prime western zinc was cut $1 a ton last week but other nonferrous metals displayed a steady tone. Buying activity was light for most metals.

Copper—Sales slumped from the fairly active pace of previous week. Modified sales program under the code was extended to the end of March, although the normal book of 30,000 tons is expected to be reached this month. Increased buying is anticipated to replenish fabricators' stocks. Prices held steady here but weakened abroad.

Lead—Sales were moderate in volume with prices firm on the basis of 3.55c, East St. Louis, for spot. An additional rise in refined stocks during December of 2523 tons was reported. Consumers' February needs are estimated as 50 per cent covered.

Zinc—Prime western prices fell to 3.70c, East St. Louis, but metal available at that level is believed limited. World zinc output during December was cut 23 tons daily from the November rate.

Tin—Supplies of spot Straits tin were limited and influenced prices which held fairly steady around the 51.00c level. Demand was light.

Antimony—Only occasional small-lot interest was noted in the market and prices held unchanged on the basis of 14.50c, duty paid, for Chinese spot.

Aluminum—Held steady in a quiet market.

Steel in Europe

Foreign Steel Prices, Page 48

London—*(By Radio)*—Steel and iron markets in Great Britain are quiet, following recent active buying, but specifications against contracts are being filed regularly. Demand for ferromanganese is increasing. Shipments of hematite pig iron to Scandinavia and Italy are in good volume. Steel mills are fairly busy, though new business is quiet. Exports of galvanized sheets are dull.

The Continent reports a fair movement, Britain taking considerable semifinished steel. The Argentine is an active buyer but demand from the Far East is light. Belgian domestic trade has improved.

Quicksilver

New York—Quicksilver prices are firm. Round lots of 100 flasks are available down to $72.50, a virgin flask of 76 pounds, and small lots of 15 to 24 flasks inclusive at $74. Demand is moderately active.

Labor

(Concluded from Page 14)

tions board for elections for employe representatives for collective bargaining. On Jan. 18 the board ordered elections at Pittsburgh Steel Co. plants within two weeks. Similar actions have been filed by Carnegie Steel Co. and Youngstown Sheet & Tube Co. employes.

Iron Ore

IRON ore shipments from mines in the United States, exclusive of those that contained 5 per cent manganese in the natural state, are estimated by the bureau of mines at 25,995,000 gross tons, 6 per cent more than in 1933. The average value of the ore at the mines was $2.58 per ton, 1 cent less than in the preceding year. Stocks at mines, mainly in Michigan and Minnesota, decreased 5 per cent to 10,387,000 tons.

Shipments from districts: Lake Superior, 22,119,000 tons, including all-rail tonnage; southeastern, 2,670,000 tons; northeastern, 927,000 tons; western, 279,000 tons. The Lake Superior shipments increased 3 per cent; southeastern, 22 per cent; northeastern 65 per cent; western decreased 28 per cent.

Total shipments of manganese ore, exclusive of Puerto Rico, consisted of 17,100 long tons of metallurgical and miscellaneous grades valued at $305,000, compared with 10,654 tons valued at $186,407 in 1933, and 8300 tons of battery ore valued at $295,000, against 7904 tons valued at $265,766 tons in 1933.

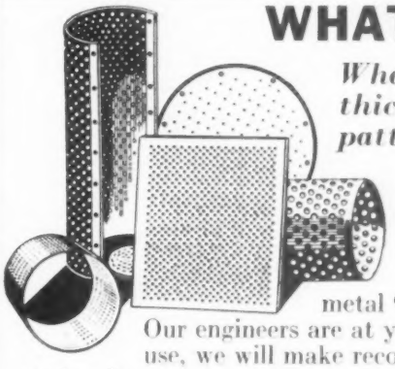
Transportation

CARLOADINGS of leading commodities in the first quarter of 1935 will reach 4,528,774, against an actual 4,500,200 in the opening quarter of 1934, it is estimated by the Regional Shippers' Advisory board. This is an increase of 0.6 per cent. A comparison of estimated carloadings for the first quarter with the actual loadings a year ago of leading commodities follows:

	1935	1934
Iron and steel	225,139	213,306
Ore	50,694	47,621
Machinery and boilers	20,480	18,163
Farm implements	11,989	9,945
Coal and coke	1,976,764	1,967,533

A "ZEPHYR" FOR ITALY

A stainless steel streamlined train to be modeled after the Burlington



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Wickwire Spencer Steel Company, 41 East 42nd Street, New York City; Buffalo, Chicago, Detroit, Philadelphia, Tulsa, Worcester; *Pacific Coast Headquarters:* San Francisco; *Warehouses:* Los Angeles, Seattle, Portland. *Export Sales Department:* New York City.

WICKWIRE SPENCER
PERFORATED METALS

Zephyr is in the process of construction now at Genoa, Italy. Sixty thousand pounds of stainless steel in strips, tubing, sheets, and floor plates were recently shipped by the Allegheny Steel Co., Brackenridge, Pa., to Piaggio Inc., the manufacturer. This is the largest single export order for stainless steel in several years.

This new Italian train of three cars, like the Burlington Zephyr, will utilize the shot-weld process of construction, perfected by the Edward G. Budd Mfg. Co., Philadelphia, which will supervise the building.

¶A bill introduced last week in the New York legislature gives New York city elevated and subway systems one year in which to replace all wooden cars with steel equipment.

NRA

EARLY approval of cost estimating formula for the steel plate fabricating industry was urged upon NRA at a meeting of the Steel Plate Fabricators' association and the code authority of the industry at Chicago, Jan. 15. In this connection the industry cites three factors for NRA to consider: Price fixing, price registration, and cost estimating formula. All members of the code authority and of the association directory were re-elected. Tom R. Wyles, 37 West Van Buren street, Chicago, is secretary of the code authority.

Meetings

CHICAGO section of American Society of Mechanical Engineers is planning a machine shop practice meeting and exhibit for the afternoon and evening of March 28 at the Engineering building, 205 West Wacker drive, Chicago. Papers will be presented by several well-known people in the machine tool, steel and manufacturing industries. C. B. Cole, Tool Equipment Sales Co., Chicago, is chairman of the meeting.

CALL WASHER MEETING

Plain Washer Manufacturers association will meet Feb. 4 at the William Penn hotel, Pittsburgh. All plain washer manufacturers whether or not members of the association are invited.

REINARTZ ON PROGRAM

L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O., will be the speaker at a meeting of the Blast Furnace and Coke association of the Chicago district, at the Hotel Shoreland, Chicago, Jan. 28. His talk, second of a series of three lectures being given by the association, will be "Making Steel in the Open Hearth". H. W. Johnson, Inland Steel Co., Indiana Harbor, Ind., is secretary.

SCHEDULE WELDING MEETING

Fourth annual welding conference of the department of industrial engineering, Ohio State university, will be held Feb. 28 and March 1 in the university's industrial engineering building at Columbus, O.

Financial

DIRECTORS of Otis Steel Co., Cleveland, Friday authorized payment of the two remaining unpaid coupons of March 1, 1934, and Sept. 1, 1934, on the 6 per cent sinking fund gold bonds, Series A, dated March 1, 1926.

Holders of these bonds may collect the coupons by surrendering them on or after Jan. 30 to National City Bank, Cleveland, or City Bank Farmers Trust Co., New York.

President Kulas stated that the officers of the company recently had negotiations looking toward a 3-year loan of approximately $2,500,000 to enable the company to pay the indebtedness to banks and others which it had been carrying on 90-day maturities. Plans so far are incomplete.

¶Fostoria Pressed Steel Corp., Fostoria, O., is reducing its capitalization from $275,000 to $225,000 by retiring 7595 no-par common shares from its treasury stock, leaving 19,905 shares outstanding.

¶Washington Tin Plate Co., Washington, Pa., reports net earnings of $140,640 in 1934 equal to $8.98 a share. In 1933, the company reported net earnings of $115,223, equal to $7.68 a share.

UNITED PROPOSES SPLITUP

United Engineering & Foundry Co., Pittsburgh, directors meeting Jan. 22 voted to submit to stockholders' vote on April 23 a plan to change the company's common stock from no par to $5 par, whereby two new shares would be issued for each present share and involving the total issue of 1,000,000 new shares as against 416,118 shares listed as of last listing and with a stated value of $5,409,000.

Directors on Jan. 22 voted the regular $1.75 preferred dividend and an unchanged 25-cent common dividend both payable Feb. 8 to Jan. 29 record.

¶General Electric Co., Schenectady, N. Y., reports its orders in 1934 total $183,660,303, or 29 per cent over 1933. Orders in the fourth quarter were $51,046,760, a gain of 34 per cent over the corresponding quarter of 1933.

Merger

DAILY newspapers last week used names in discussing the report that the National Steel Corp., Pittsburgh, and Inland Steel Co., Chicago, were holding conversations relative to a merger. (STEEL, Jan. 14, p. 14, Jan. 21, p. 42). Officials of both companies intimate or admit that the matter has been discussed, but no assurance of consummation is forthcoming. National's capacity is 2,232,000 tons of ingots annually, Inland's 2,000,000 tons. National, with plants at Weirton, W. Va., and Detroit, has never built up its site just east of Gary, Ind.

Here and There In Industry

TIMKEN ROLLER BEARING CO., Canton, O., is producing 1400 tapered roller bearings, weighing 185 tons, for the new steel mills being built for the Ford Motor Co., Dearborn, Mich., by the United Engineering & Foundry Co., Pittsburgh. The bearings are in 87 sizes, from 2 x 3½ inches, weighing 1 pound, to 30 x 47 inches, weighing 7640 pounds each. Back-up roll necks of the 21, 46 and 56-inch four-high hot strip mills and the 18, 46 and 56-inch tandem cold strip mills will have 52 bearings 25½ x 40½ inches, each weighing 4086 pounds. Loads on the back-up roll necks of the 20½, 56 and 84-inch single-stand reversing cold mill will be carried by four bearings 30 x 47 inches. It is believed this is the largest single order for steel mill antifriction bearings ever placed.

□ □ □

Sperry Corp., New York, has bought the entire stock of the Waterbury Tool Co., Waterbury, Conn., and will continue operation of the plant on regular production, including oil gears, variable speed transmissions, submarine hoists, gun elevators, turret turning devices and other products used by naval and merchant ships. The Sperry Corp. manufactures gyroscopic devices for ships and

airplanes at its plant at Brooklyn, N. Y. Capt. Thomas B. Doe, New York, vice president of the Sperry Corp., has been elected president of the Waterbury company, and John Sanderson and Lane McLean, New York, vice presidents.

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Lappan Mfg. Co. plant at Pittsburgh has been sold for wrecking. The plant was built in 1872 and was one of the first in the Pittsburgh district to manufacture steel boilers, continuing in operation until a few years ago.

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Buffalo Pattern Works Inc., 830 Hertel avenue, Buffalo, has installed several time saving machines in its metal pattern department. The company just has finished 41 years of successful business.

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Timken Steel & Tube Co., Canton, O., and the Aluminum Co. of America, Pittsburgh, have been licensed to manufacture tubing under the patent of the Tube Reducing Corp., 292 Madison avenue, New York.

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Ferro Enamel Corp., Cleveland, has completed installation of a propane-fired continuous porcelain enameling furnace at the plant of the Kelvinator Corp., Grand Rapids, Mich., one of the largest continuous-type installations ever built.

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Foote Bros. Gear & Machine Co., Chicago, has appointed C. A. Hayward, 7310 Woodward avenue, Detroit, sales and engineering representative for its speed reducers in Detroit territory. G. W. Craighead, formerly representing this company, has made another connection.

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Binks Mfg. Co., Chicago, has formed a Canadian company under the name, Binks Mfg. Co. of Canada Ltd., Windsor, Ont. Neil C. Hurley, president, and J. F. Roche, vice president and operating head of the parent company, are principal officers of the Canadian company.

□ □ □

C. G. Munn, president of Reynolds Spring Co., Detroit, and John H. Merrel, Chicago, vice president of Raybestos Manhattan Co., have bought the majority interest of Wiley R. Reynolds in the Reynolds Spring Co., the latter resigning as chairman of the board of directors.

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Allis-Chalmers Mfg. Co., Milwaukee, has opened a district sales office at 1609 Merchants Bank building, Indianapolis, taking over some territory from the Chicago office. The office, which will be in charge of Harry C. Crawford, will cover two-thirds of Indiana and western Kentucky, including Louisville.

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William Jessop & Sons Inc., New York, tool steels, has appointed the Fulton Supply Co., 342 Nelson street S. W., Atlanta, Ga., its southerr sales representative. Complete stock will be carried.

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Wesley Steel Treating Co., 1321 West Pierce street, Milwaukee, has been given an exclusive license by the Chapman Valve Mfg. Co., Indian Orchard, Mass., to use the latter's Chapmanizing process of heat treating in Wisconsin and coast cities of Michigan until 1941. A unit for performing this work has been installed.

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Medart Co., St. Louis, manufacturer of power transmission equipment, has appointed Machinery & Welder Corp., 312 North Sheldon street, Chicago, its sales representative for northern Illinois, northern Indiana and southern Wisconsin. Complete stock of power transmission equipment will be carried. A branch office is maintained at Milwaukee.

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Kimball-Krogh Pump division, Victor Equipment Co., Los Angeles, has developed a new line of sewage and trash pumps for use in sewage plants and also in paper pulp mills, beet sugar plants, canneries and other plants where process waste must be removed. The principal feature in this new line is an improved design of the impeller vanes to make the pumps nonclogging.

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New Jersey Zinc Sales Co., 160 Front street, New York, has bought from the estate of Ralph E. Potter, who was associated with the New Jersey company for many years, the business of David Randall & Co. and will continue the business under the name of New Jersey Zinc Sales Co. from the same Boston address, 55 Kilby street and the same Boston warehouse. George W. Harragan will continue in charge as New England representative.

□ □ □

National Railways of Mexico has purchased from the Pullman Car & Mfg. Corp., Chicago, the private car "Adventurer", which has been in use in this country for several years. It is luxuriously fitted for comfortable traveling, including Hyatt roller bearing journal boxes. It is being operated as a business or private car in Mexico. P. C. Morales, superintendent of National Railways, advises no changes have been made in superstructure or trucks.

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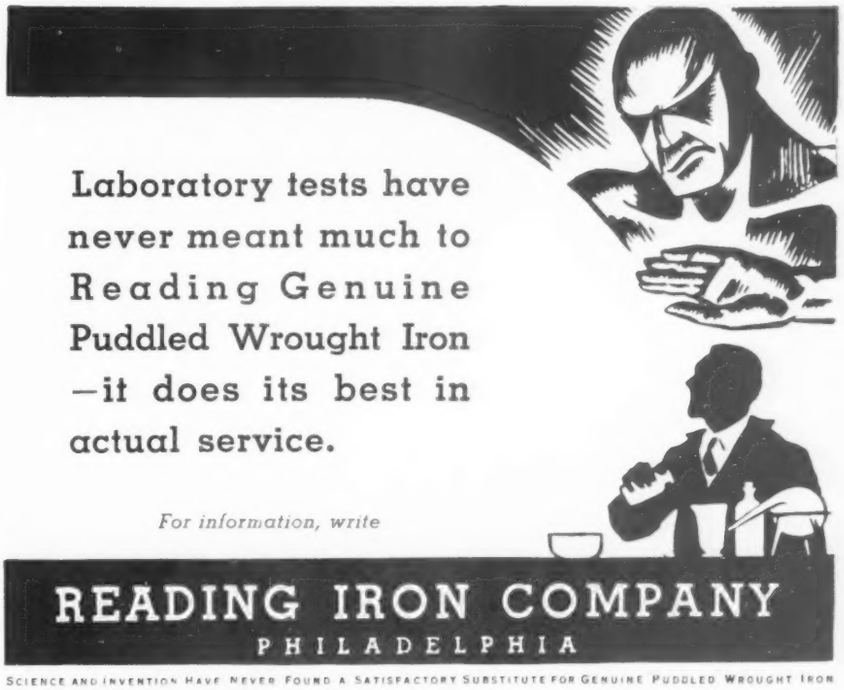
Herbrand Corp., successor to the former Herbrand Co., Fremont, O., has taken over the plant and business of the latter, which has been in trusteeship and receivership. The reorganized company has elected Stanley S. Boyer, Fremont, president; B. O. Mead, Detroit, vice president; C.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Traub Gottran, Fremont, secretary and treasurer. Drop-forged automotive parts constitute the company's output. Personnel of the old company will be retained in large measure.

□ □ □

American Tar Products Co.'s name has been changed to Koppers Products Co., according to recent announcement by the parent company, Koppers Co., Pittsburgh.

Equipment

Washington—The army ordnance department probably will open bids in March for approximately $600,000 worth of machine tools. That is the remainder of a fund of $2,300,000 which is unexpended and which was turned over to the army for the purchase of machine tools by PWA. It was expected at one time, that $100,000 or more would be saved out of this fund to be given to the various arsenals for their own use in purchasing tools. However, this plan has been given up, and bids will be taken here. It is expected that specifications will be ready about the middle of February.

Boston—With most larger machine tool builders active on recent orders, largely for the government, an improved inquiry and some increase in buying is encouraging. Grinding machine activity has gained, a mid-west bearing maker having placed a battery of grinders with a Worcester shop which also booked export orders for Japan. Another interest recently has taken some volume for Russia. One paper mill machinery builder is active.

New York—Machinery and equipment inquiry holds with figures in on a large volume of government requirements. Bids on several hundred tools for New York city technical schools will be readvertised.

Pittsburgh—A large Pittsburgh district independent steel producer recently placed an order for a new blooming mill involving an expenditure of approximately $80,000. First shipments on 1400 tapered roller bearings were made last week for the new Ford Motor Co. sheet mill at Dearborn, Mich. United Engineering & Foundry Co. has closed on an order for the gears involved in the Galipolis, O., dam.

Lewis Foundry & Machine Co., has received an order for a 3-high mill complete with tables from Bethlehem Steel Co., duplicating a mill furnished to this company about a year ago, except that the new mill will be used for sheet breakdown up to 60-inch width. Lewis has also received an order for two additional finishing mills for Ball Bros. Co., Muncie, Ind., to be used for rolling zinc sheets.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has received an order from the Tennessee Valley authority for two waterwheel generators and auxiliary equipment, involving expenditure of $900,000.

San Francisco—Bureau of yards and docks, navy department, closes Feb. 13 on a 40-ton outdoor electric gantry crane and runway for Mare island. Bureau of supplies and accounts closes Feb. 1 on eight engine lathes for the Puget Sound navy yard.

Chicago—American Hoist & Derrick Co., St. Paul, is low on seven large locomotive cranes for Mississippi river dams, bids submitted to United States, engineer at St. Paul, Jan. 10.

Construction and Enterprise

New England

STAMFORD, CONN.—Yale & Towne Mfg. Co. has placed a contract with Link-Belt Co., 910 South Michigan avenue, Chicago, for foundry sand handling equipment, including a vibrating shakeout screen.

BOSTON—Cooling & Air Conditioning Corp., division of the B. F. Sturtevant Co., Boston, has been awarded contract for complete air conditioning of Spruance plant No. 2, near Richmond, Va., for the DuPont Rayon Co.

SPRINGFIELD, MASS.—An appropriation of about $500,000 is being awaited for modernization of the two plants of the United States armory here. Col. T. J. Smith is commandant. Installation of machinery will take about four months.

WORCESTER, MASS.—New England High Carbon Wire Co. is building an addition to its plant to accommodate a 50-foot tempering furnace, to be installed by the H. B. Dempsey Furnace Co.

New York

NEW YORK—Standard Gas & Electric Co., 111 Broadway, has appropriation of $7,157,400 for extension of electric light and power plants in different sections of country, including equipment, power substations, and transmission and distribution lines.

ROME, N. Y.—Plans are being made to reopen the Rome Grader Co. plant early in February for the manufacture of the Rome grader and other equipment, such as snowplows and auto-type mowing machines. The company is the property of the Revere Copper & Brass Corp., but it will be operated as a separate unit.

NEW YORK—Naylor & Newton Inc. has been incorporated to manufacture machinery, by Joseph D. Allen, Irving Schneider and Bertha Greenspan. Papers were filed by Wilber, Norman & Mosher, 299 Broadway.

NEW YORK — Weiderman Iron Works, 106-8 Classon avenue has been formed by Arthur S. Weiderman.

PENN YAN, N. Y.—Penn Yan Bodies Inc. recently sustained damages to its plant by fire, including loss of special tools and machinery used in the building of bus bodies.

Pennsylvania

HAWLEY, PA.—Fairplay Knitting Mills Inc. is planning installation of motors and controls, conveyors, etc., in connection with rebuilding of its plant recently damaged by fire.

PITTSBURGH—McKeesport Coal & Coke Co., Keystone building, has placed contract with Link-Belt Co., 910 South Michigan avenue, Chicago, for a 125-ton per hour tipple and Link-Belt Simon-Carves washery to be installed at its Hubbard mine. Facilities for loading both railroad cars and local trade trucks will be included.

YORK, PA.—York Ice Machinery Corp. has received contract approximating $70,000 for air conditioning 21 cars for the Reading Co., and 10 for the Central Railroad of New Jersey.

Ohio

BUCYRUS, O.—Bucyrus Casting Co. has been formed by Arthur T. Schuler, William Breymaier and Edward Kline. The company will be housed in one of the old Ohio Steel foundry buildings and will have a capacity of five tons of castings at one heat.

CLEVELAND—United States Atmospheric Purifying Co. has leased a factory with 7000 square feet of space at 2176 East Seventy-sixth street. Carl J. Schobrone is president.

MASSILLON, O.—Bowdil Co., mine tool manufacturer, recently sustained damage by fire to its plant at Bowdil, O., near here.

POMEROY, O.—Essex Coal Sales Co., Pomeroy, O., will build a coal loading wharf near Minersville, O. A belt conveyor system from the river to an existing pier is contemplated.

VAN WERT, O.—Van Wert Foundry is expected to resume operations soon, as announced by Samuel Devore who recently purchased the foundry.

YOUNGSTOWN, O.—McKay Machine Co., which recently enlarged its plant, is operating its shop on a 24-hour basis, with more than 100 machinists occupied, as reported by A. J. Wardle, president.

Michigan

CHESANING, MICH. — Roycraft Coach Co., manufacturer of auto trailers, is establishing a plant here. J. G. MacKay is secretary.

HOLLAND, MICH.—Carl E. Swift Corp. has been organized to manufacture electric washing machines and other appliances. Carl E. Swift is president.

KALAMAZOO, MICH. — Mid-West Iron & Metal Co. has been formed by Sidney Konigsberg, 1128 Roseland avenue.

Illinois

CHICAGO—Scott Automotive Products Co., 2619 South Michigan avenue, has been incorporated to manufacture and distribute automotive replacement parts, by Jules B. Newman, Harold Poncher, and Leonard S. Poncher. Correspondent: Samuel L. Bullas, 1720 Steuben building.

CHICAGO—Wetzig Mfg. Co., 2600

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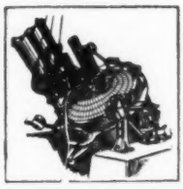

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Fletcher street, has been organized by Alfred Wetzig, Helen Wetzig and Leonore Wetzig, to manufacture and sell lubricators, oil pumps, valves, gauges, machine attachments and steam and gas engines. Correspondent: Rieger & Rieger, 11 South LaSalle street.

CHICAGO—Central Tools Inc., 80 East Jackson boulevard, has been incorporated by Samuel R. Whittelle, E. M. Holdt, and David Brandwein, to do general gauge and machine manufacturing. Correspondent: Samuel R. Wittelle, 7 South Dearborn street.

CHICAGO—Rockwell Mfg. Co., 2240 Ogden avenue, has been organized to deal in automotive hardware and electrical parts, equipment etc., by S. J. Irving and Richard Harris. Correspondent: Louis Friedman, 221 North LaSalle street.

HAVANA, ILL.—Crescent Forge & Shovel Co. is planning to rebuild its plant recently damaged by fire. (Noted Dec. 17).

NORTH CHICAGO, ILL.—Automotive Maintenance Machinery Co., 816 West Washington street, Chicago, has purchased the Chemical Products Co. building at 2206 Commonwealth avenue, North Chicago, and will move its machinery and equipment from Chicago to this location.

PEORIA, ILL.—Avery Power Machinery Co., 2300 North Adams street, has been incorporated to manufacture mechanical devices, by John W. McDowell, R. S. Wallace, and G. W. Mitchell. Correspondent: R. J. Boynton, Avery Power Machinery Co., Peoria, Ill.

Alabama

BIRMINGHAM, ALA. — Pittsburgh Plate Glass Co., Grant building, Pittsburgh, has leased a site here at Ninth avenue and Twentieth street, north, and plans to erect a building at a cost of about $40,000, for cutting and storing glass and other products handled by the Birmingham branch.

Florida

MIAMI, FLA.—Florida Cane Products Corp., William C. Chadwick vice president, 139 Northeast First street, will probably start work in April on distillery plant and warehouse.

Kentucky

LOUISVILLE, KY. — Brown-Forman Distillery Co., 1908 Howard street, plans expending $100,000 for 7-story and basement addition.

Maryland

CUMBERLAND, MD.—City commissioners will seek permission from state legislature to issue bonds for $1,500,000 light and power plant.

CUMBERLAND, MD.—German Brewing Co. has placed contract with Link-Belt Co., 910 South Michigan avenue, Chicago, for coal handling equipment, comprising track dump hopper, feeder, crusher, bucket elevator, distributing conveyor overhead, and a 500-ton capacity bunker with spouts to automatic stokers.

HAVRE DE GRACE, MD.—Harford Pure Rye Distillers Inc., 1008 Garrett building, Baltimore, is now ready to start work on remodeling existing buildings and erection of additional buildings for distillery with 1,500,000-gallon capacity. Project is under supervision of Patrick J. Murray Contracting Corp., 432 Fourth avenue, New York.

North Carolina

WINSTON-SALEM, N. C.—W. C. Olsen, engineer, Raleigh, N. C., is making a survey for power plant estimated to cost $200,000 to be erected by city of Winston-Salem. (Noted Jan. 14).

Tennessee

SPRINGFIELD, TENN.—Tennessee Light & Power Co. Inc. has acquired a building which it will remodel for its headquarters.

West Virginia

RANDALL, W. VA.—Kelleys Creek Colliery Co., Western reserve building, Cleveland, will build a large loading dock on the left bank of the Monongahela river here.

Virginia

NORFOLK, VA.—Norfolk & Western railroad, Roanoke, Va., has started work on $1,600,000 steel coal pier. Project will require 2200 tons of steel and an automatic electric car dumper will be installed together with chutes with capacity of handling 50 cars of coal per hour.

Missouri

ANDERSON, MO.—City voted $55,000 bonds for erecting hydroelectric plant.

KANSAS CITY, MO.—Summerour & Devine Inc., 3726 College street, has leased a building at 115 West Seventeenth street which it is planning to remodel for the manufacture of ornamental bronze products.

SPRINGFIELD, MO.—Drury college, Dr. T. W. Nadal president, is planning a $25,000 improvement program, including erection of power house.

ST. LOUIS—Laclede Power & Light Co., Edward P. Gosling president, 1017 Olive street, plans building $2,000,000 power plant adjoining present plant. Work will be started soon on $200,000 boiler house for new plant. Two 15,000-kilowatt generators and three 1350-horsepower boilers will be installed.

Arkansas

DUMAS, ARK.—City is planning $42,000 sewage collecting and disposal plant. H. R. Carter, engineer, National Standard Building, Little Rock, Ark.

Oklahoma

ADA, OKLA.—Harwell-Parks Machine Co. has been incorporated by C. C. Harwell and Rex Parks, to manufacture and repair oil field tools. A machine shop, 25 x 60 feet, has been erected. Carroll Brown is shop superintendent.

ELK CITY, OKLA.—City has voted $350,000 bonds for construction of waterworks system.

OKLAHOMA CITY, OKLA.—Anchor Burner Co. has been formed with $15,000 capital to manufacture oil field burners, by H. J. Clough, 313 Northwest Twenty-eighth street.

OKLAHOMA CITY, OKLA.—Star Mfg. Co., 3012 South Stiles street, has erected a shop building, 46 x 72 feet, and will enlarge the building by an addition, 40 x 112 feet. The company fabricates steel and sheet metal products used in the oil fields.

SAND SPRINGS, OKLA.—Guy P. Slater Inc. has been incorporated to manufacture oil field equipment, by Guy P. Slater, President.

TULSA, OKLA.—Victor Drilling Tool & Supply Co. has been incorporated to manufacture oil field tools, by G. H. Blankenship, 739 Kennedy building.

Texas

DALLAS, TEX.—W. A. Craddock, 3529 Granada street, has acquired a 9-acre tract as the site for the erection of a brewery for a client. The cost is estimated at $500,000.

FORT WORTH, TEX.—Union Machine Works has been incorporated with a capital of $10,000 by George C. Street and Leon L. Sanders.

FORT WORTH, TEX.—City is negotiating for PWA loan and grant of $2,228,000 for building power plant.

HOUSTON, TEX.—Mission Mfg. Co., manufacturer of oil field equipment, is completing a new manufacturing plant, 100 x 138 feet. Approximate investment in plant and equipment will total $75,000. A separate building will house a heat treating unit. W. B. Sharp is president.

HOUSTON, TEX.—Standco Oil Tools Inc. has been incorporated with $20,000 capital for manufacturing purposes, by C. W. Hanslip, president. A shop building at 1206 North San Jacinto street has been leased.

SAN ANTONIO, TEX.—Texas Oil Corp. has been incorporated to manufacture piston rings, by E. A. Droemer, 635 South Presa street.

SAN ANTONIO, TEX.—San Antonio Brewing association is making improvements to its plant, including remodeling the first and second floors, and installation of new storage tanks to cost $31,000 and new bottling equipment to cost $28,000. Total estimated cost is $100,000.

SAN BENITO, TEX.—Vermilya-Huffman Co., care of Carl I. Friedlander, receives bids soon on airport facilities, including hangars and shops.

Wisconsin

MILWAUKEE— W. L. Coffey, manager of Milwaukee county institutions, will close bids Jan. 31 for construction and equipment of central laundry plant, 188 x 292 feet, estimated to cost $164,980. Eschweiler & Eschweiler, architects, 720 East Mason street, are in charge.

SUPERIOR, WIS.—Roland C. Buck Inc., architect and engineer, 919 Tower avenue, is at work on plans for a $150,000 addition, 90 x 140 feet, to the Superior vocational school.

WAUKESHA, WIS.—Freyn Engineering Co., 310 South Michigan avenue, Chicago, has taken contract for building and installing all brewing equipment, machinery, etc., for large addition to plant of Fox Head Springs Beverage Co. here.